



**Exam data bse managent system
information student , edutcation**
Tshingombe tshitadi

Exam finan eduction trade

pc5
[Pick the date]

**Re: Release resultat statement and finalize award
diploma./irregularilarity case .re marker**

Inbox

TSHINGOMBEKB TSHITADI
<tshingombekb@gmail.com>

Fri, May 12,
8:21 AM

to CallCentre, careerhelp, examirregularity, Foreign, info, info, nyko,
QCTO, TSHINGOMBEKB, pdevilliers.p, me, tshingombe

Hello dear

On Mon, 08 May 2023, 14:38 TSHINGOMBEKB TSHITADI,
<tshingombekb@gmail.com> wrote:

Enquiry:to national examination and assessment college principal
organisation . Chief invigilator committed irregularity

-chief directorates national examination

Dhet./ And SAQA evaluation/QCTO,

Registrar /

Mr:Pdevilliers.

Application from:

Student ID: 2100002023812.

Student name.tshingombe Tshitadi

College instituts name St peace college

Exam :external shalom technical :

.899993812

:Afric policing instituts

-Memorandum :2023/0508

Requested letter reasoning for :

release finalize n diplomat studies engineering electrical

Good day dear :

I'm applying to claim for your attention in your department and instituts to regarding my application

In consolidation .

Release of November examination to verify the outcome of irregularity observed the quality assurance bodie responsibility for TVET college qualification n diplomat engineering studies electrical engineering.

Didn't have received the letter approved release November engineering studies subject under investigation and invalid subject n3 trade electrical theory transcript registrar tick sign to day of exam n4 electrotech chief invigilator and assessment deal with 21 days of publication and consider all evidence a ailable make decisions base will notify the examination as soon it possible it finalized, candidate fail to submit additional information receipt. Statement submitted number 1980/11/10..notify 1982/11/10 N4 fail druip. Review statement n1,n2,n3,n4 statement released marking scale submitted Portofilio evidence Poe s engineering electrical time table college private system assessment police , evidence docket documents examination reference student examination semester 4, Portofilio online send additional information system to saqa instituts foreign award meeting requireded documents completed exam dheth framework engineering electrical icass evidence based topics scaling process on line meet award certificate investigation documents police criteria , council quality.meet Conductor assessor saqa . engineering criteria.marking in progress documents Portofolio value assessment police and engineering council Dheth.

We are alert your attention in department busy conducting subject investigation and envisaged that the result will be release by it responsabilitie,inform that candidate release subject on line

The department of labour electrical and engineering still busy finalising the mechanical of engineering examinations script plant engineering the

results in certificate all effected candidate . Portofilio labour expiremental
icass in circulum saps seta sasseta CETA verification for trade practices
panel electrical wiring.plumving in trade theory

base engineering design investigation

additional information evidence base .

Examination national irregularilary committee n4-n6...n1-n3 appealing
process ,and activity notice letter to get instituts notify candidate
outcome of the meeting serious,closing date registration final submission
of script letter 21days affidavit submission and final..

Ref. All affected candidate who do not received their results immediately
must be registered to rerwiten subject during next examination cycle as
note late entree will be accepted in Portofilio assessment topic and
completed submitted additional information system and the application
proof must be submitted a register must be compiled on the template
provided and send to the owner.no application for remark received after
close date will be deemed irregularilary and not be processed .
examination centre responsible for refunding candidate in case of
application submitted after closing.

The according to national conduct policy the script may be destroyer
6monty after the release of the results for business month for engineering
no application for remark re check of script will be accepted beyond and
receive November February,2023 exam cycle,and all candidates who have
pending outcome resultat and have not received the outcome are mark
re-maek recheck process must be registered for the next examination
cycle no late entries will be accepted,

Code 1104126, subject electrical trade theory ,level 3 reason under
investigation .the process in Portofilio evidence topics learner in saqa
documents meeting requireded.

Thanks u for your attention.

Foreign institutions inquiries: #6594

Inbox



Foreign Institutions
<foreigninstitutions@saqa.co.za>

Fri, Jul 8, 2:53 PM (2
days ago)

to
me

Thank you.

SAQA has received your enquiry and will respond to it within two working days, unless further research and/or consultation is required.

Your Reference number is: **#006594**

Kind regards,

SAQA



Name: tshingombe

Country :south Africa

Purpose: check status before applying

Email: tshingombe k@ gmail.cok

Institutionbsawainsty St Peace Afric

Application

Submission number/ name/ date /status

20220785055/Tshitaditshingombe/202207_08 stared

Over view qualifications history purpose resulted in line access new application name of qualifications award by instituts

The qualifications was completed award by country from general employment future study high education university undergraduate.daved application estimated submission no 202207125014 qualifications holders tshitaditshingombe

Date submitted 2022-07-12;10:07;22 current status estimated completion..

Foreign instituts inquired policy criteria outcome assessment award meeting section 29(a),march2027.saqqa application 201911130002 for TshitadiFiston does not meet our requirements and is being returned explanatory letter refunded saqa..

Dear 29(a) of the and criteria for evaluation foreign qualifications withing the south African NQF as amended march2017) stipulation the requirements that a foreign awarding institutions must meet for its qualifications to be recognised.saqqa. Base the advice below on information current to it saqa reserves the right to change this advice should new authoritative information come to its attention.our online application documents stipulated the following in terms of schooling qualifications.saqqa accept only schools leaving qualifications issued by the official examine certification body in the country of original and not by the school where based where base on external examination.

No certificate of evaluation will be issued for school leaving than those in respect of completed national school existing qualifications issue by the relevant authorities.

Therefore.only school leaving qualifications correctly [awarded.by](#) the authorised national examination booklet in the democratic republic of Congo will be recognised and not school leaving documents issue by the schools it self .note the purpose of this overseas instituts email is to give people some direction regarding accreditation band non accredited

foreign instituts for the purpose of recognised acceptance by Sawa for foreigners.qualification .

Kind regards authentication service

Saga the national qualifications framework (NQF) act 67of

2008mandates saga to provide . Qualifications evaluation and advisory services which it does in accordance with the policy and criteria for evaluation foreign qualifications with the south African NQF as amended March 2017secyion29(a)of the policy and criteria stipulation the requirements that a foreign an awarding stipulate the requirements that a foreign.an award stipulated the requirements that a foreign an awarding institutions must meet for its qualifications to recognise.

utomatic reply: 202207085055

Inbox



foreignapplicationsvia eur02-he1-obe.outbound.protection.outlook.com

Fri, Aug 12, 8:47 PM (2 days ago)

to
me

Dear SAQA Applicant

We have received your application for the evaluation of your foreign qualification(s) and will revert to you as soon as possible with either your reference number or further correspondence.

Please take note of the following:

SAQA is going through a transitional period, which has resulted in some delays in the processing of Foreign Evaluations applications as well as responses to telephone, email and social media enquiries. We are doing our best to expedite applications and to respond to enquiries. To make it easier for you to use our services, we have placed all the information you need on our website.

Do not resend your application unless SAQA requests you to do so - neither by e-mail, nor by courier. Duplicate applications unnecessarily delay the process.

When requested to submit additional documents, please log into your SAQA online profile and upload all the outstanding documents together with the documents that were previously submitted (Complete application pack) DO NOT SEND THESE VIA E-MAIL

This e-mailbox is only for receiving e-mail applications, do not use it for anything else; otherwise, it will be ignored.

All enquiries are to be referred to the Foreign Qualifications Contact Centre using the contact details, +2712 431 5000 or dfqeas@saga.co.za.

For additional information, you can access the SAQA website at <https://www.saqa.org.za/>

Kind regards

Directorate: Foreign Qualifications Evaluation and Advisory Services
(DFQEAS)

202207085055

Inbox



foreignapplications<foreignapplications@saqa.co.za> Fri, Aug 12, 3:07 PM (2 days ago)

to
me

Good day,

Kindly resubmit all the documents that you have uploaded on your online portal via email including the outstanding

Application form / invoice generatedfrom the online application system

Proof of payment of the amount reflected application form / invoice

A consent form signed by the above-mentioned qualification holder.

Valid proof of identification of the above-mentioned qualification holder

Final award certificate(s)

Academic transcript(s)–

Thank you

Regards,

Saga statement certificate work :

Statement of work experience .program code. Electrical engineering
saqa..qualifications I'd :90643 national n diplomat.engineeringstudie
electrical n diplomat engineering.
NQF level 6,360. Learner details.
Company name ..St peace college
..interpre dream look for evidence job requirements.check.folow.
2.mesire for checking wiring and circuit
Installation and circuit up1000v AC preparing work on accordance
legislation required operational procedures and hazard and safety
requirements.opetating procedure work using instrument
measure.checkmaterial.for conform process.selection,
Cable installation cable .wire system and enclosed support
system.marking labelled testing wiring.completing report and documents
shortly comment and terminology..
Engineering diploma electrical sub electronics record and verified
relevant circuit assembly electronics schematic.
Tagg.testing checking modified
Entering routine informatonvproforma.mainyen repaired control
system .diplomat.look for evidence confirm skill.check operational control
device signal obtained.interpre.relevantplaningpersonal.cpnform control
operation response..
Engineering dismantling .disassembling.servicrable item . setting up
appropriate test and calibration equipment settings..
Test skill knowledge dream statutory electrical wiring support and
protection.requirementterminal.televany .manufacture.conductorconnect
ion.conection report
.select transmission final control.indtsll.loval installation.

Side cutter

Sed for cutting or tmming of connecting wire terminal lead in circuit
components or terminal lead in the circuit board long nose plus.sed.
Holding bending and stretching the lead electronic.solderingpencil.use to
joint two or more metal conductor with the support soldering.sed join
two more metal conductor with the support.
Very satisfactory performance
Satisfactory performance
Fairly performance..
Technical electrical officer
Band minimum
Could you created the latest crime figthi g technology.

Skill computer problem.corrr function

Management all electrical aspects of construction project include documents in inspection .compilation specifications saps use

Working line support and fault analysis in laboratory or I'm field a long side operational colleagues and officer.

Practices technology.

General electronic.ambdedd system including hardware and software

Knowledge of audio communication and RF.

Schematic capture PCB.scjematiic.manufacyure technical.

Qualifications.hnc/hand electronic electrical engineering systems development..

Examiner for plant engineering department health labour engineering qualify exam

Course t1. Electrical

engineering.math.engineeringbmechanic.electrotechnology mechanical applied thermodynamics steering.industrial. Electronics..

N3 engineering drawing technical

college.engineeringscience.industrialelectronics.mathematics.electrotechnic.strengh of material.conyrolsystem.mechanics.power machine s.industrial electrical...

2.structure of materials

Simple stress and strain.thing wallet pressure vessel.torsion of circular shafts.close coiled helical spring.sher force and bending moment.temperature.

Mechanical.strain energy due to direct direct.second moment of area bending stress

inbesms.strutsbuckling.catenairie.roundation.fatigue.mechanical.testing of shaft top.properties different type reinforced concrete retaining walls fastering.

THEORY of machiners

Conveyor.windingplant elevator exclavatr.tractor.motionandinertia.

Department health labour ..education

Sylabus for plant engineering

Normal duty accent .control and supervision of the safe installation competency bin the execution control and supervision

btheinstallation.maintenance and operational of machinery

1..And safety and management accident prevention risk control financial management.)). faultffind protection fault supply open circuit open

coil.breaking deceleration fault calculation breaker ..hand tools safety trade theory electrical .

Qns electrical technology

AC machine.dcgenerator.dcmotor.efficience.ac voltage and current single and three phase circuits single and tree

phase.transformation.alternatingwindings.production of rotating

magnetic fields.charateristicsynchronisationgenerous.generator.three

induction motor.semie conductor device.electric lamp and illumination.electric power transmission distribution.short circuits conditions circuits breakers.undergroundvcabke insulator overhead line ..

Questions completedelecyrical mechanical

Displacement velocity and acceleration.

Static and dynamic balance

Belt and chain drives .brakes and chain drive dynamometer.

Toothed...

3.economy power supply maximum demand

Power factor correction

Electrical

High frequency transient

Methods earth protection.storageenergy.rectification.gauly

discrimination.illumination.communication.explodion.protection.light.bas ic data transmission.

Electrical air and compressor.blower rotary compressors.

Air motor.compressorreceive.refrigeratiom and property refrigerator air conditioning psycho metric.stam heater confessed.steam and gas turbines fan.inyerbal combination engineering heat transfers.furl and combination..

Gear train lubrication.cluchrs.knowlege of machine tools

cranes.liftingequipment.bearning.

Mechanical.hydstatic transmission flow through pump friction

losses.characteristiccurves.losses measure transmission Pelton shell flow in load.hydraumecanic circuits

5.mechanic measure airflow and dusting.

Properties..

Water purification

East disposal.

Palliation.noise.illumination.

Practices knowledge factory

Planning and commission of project operational

aplannermaintenance.schem.fire prevention ad fire control loss control management.firedetection.systm accident investigation.

Testing and repair of electrical motor phasing and [synchronisation.ac](#)

motor operational in tandem fault discrimination.electric system emergency electric plant explosion proof

Hydrostatic drive classification and characteristics hydraulic circuit for sequence operational general property lubricant and additives to lubricant

Dust suppression.emisdion control of diesel engines flame proof diesel.

Boiler inspection and repaired and repaired vessel under pressure maintenance and fault diagnosis of compressor refrigerator and air conditioning ventilation system steam.

Regulatory promulgated in term section.
 General admission regulation notice.
 Electrical installation.general safety regulations.the environment
 regulatory for workplace
 The electrical machinery regulation notice.the electrical machinery
 regulation.facilityregulation..the lead regulatory..the lift
 escalator..passages..conveyor.major regulated old
 machinery.occupational health and safety act.presente being
 system.revision.

ARTISAN RECOGNITION OF PRIOR LEARNING (ARPL) TRADE TEST APPLICATION FORM

***REQUIREMENTS TO QUALIFYFOR ARPL TRADE TEST**

QUALIFYING CRITERIA CATEGORIES:	
A. Minimum three (3) years	relevant work experience within South Africa and N2certificate including Relevant Trade Theory or
B. Minimum three (3) years	relevant work experience within South Africa and Relevant Engineering NQF Level 3Certificate or
C. Minimum three (3) years	relevant work experience within South Africa and Technical Grade 12 with Maths, Engineering Science and Related Theory Subject or
D. Minimum Eighteen (18) months	relevant work experience within South Africa with Relevant Engineering NCV Level 4Certificate or
E. Minimum Eighteen (18) months	relevant work experience within South Africa and Relevant and Directly Related to the Trade Theory Subjects) N6 certificate or National Technical Diploma (S or N Stream) or
F. Minimum four (4) years'	work experience within South Africa with Grade 9 (Standard 7) or
G. Minimum three (3) years	relevant work experience within South Africa and successful completion of an ARPL Toolkits Assessment for the trades that already have toolkits in place - Diesel Mechanic; Motor Mechanic; Boilermaker; Welder; Fitter; Fitter & Turner; Electrician; Heavy Equipment Mechanic; Instrument Mechanic; Lift Mechanic; Shipbuilder; Panel Beater; Vehicle Painter, Bricklayer; Plumber; Carpenter and Sheet fed-Lithographer
H.	Successful completion of the merSETA registered NQF Level 2, 3 and 4Trade Related Learnerships with minimum two (2) years, inclusive of the institutional and workplace components.
DOCUMENTS REQUIRED WITH THIS APPLICATION (CERTIFIED BY THE COMMISSIONER OF OATH):	
NB! Certified documents must not be older than three (3) months.	
1.	Clear originally certified copyof Identity Document
2.	Clear originally certified copy of Educational Qualification
3.	Clear original or originally certified service letter on a company letter head

(with company registration number) as proof of experience within South Africa with detailed daily duties, start date and signed off by the duly authorised person.
4. Where applicable, documentary proof showing that the applicant is legally in South Africa with exclusion of medical permit.
5. A candidate, who attempted a trade test and passed at least 50% of the number of tasks given, will be given recognition for those tasks. The recognition will be retained by the candidate for a maximum of 3 attempts or 18 months from the date of successful completion of the trade task whichever comes first. Thereafter, no credit or recognition of tasks applies.
6. The merSETA will communicate the outcome of the application directly with applicant and not to third party.
7. An arrangement may be made for the merSETA to pay for the trade test fee for unemployed candidates.
8. A pre-assessment may be recommended whereby the cost will be borne by the employer or candidate.
9. Relevant work experience means according to training schedules for the trade Tool Jig, Die-Maker and Plastic Mould Makers, the applicant needs to do practical work before attempting the actual trade test. Documentation in this regard must be requested from the applicable Regional Office of the merSETA prior to the trade test date for completion.
The merSETA may decline the application if there is a conflict of interest with regard to the selected Trade Test Centre.
*The above criteria is adopted from the Trade Test Regulations Vol. 599 of 38758 of 8 May 2015 Gazette No. 10425.

APPLICATION FOR A TRADE TEST

(This form should be completed in block letters)
In terms of Section 26 D of the Skills Development Act

Surname:

tshingombetshitadi

First

Names: tshitadifiston

Race and Gender

African	Female		Male	yes
Indian	Female		Male	
Coloured	Female		Male	
White	Female		Male	

Preferred Trade Test Centre (not apl. To
INDLELA): jhbgauteng

Nation
ality:congolesase

Provi
nce: kasai

Municip
ality: kasangidi

Identity/passport number: TIRCOG000910610

--	--	--	--	--	--	--	--	--	--	--	--	--

Date of
Birth:10/111982

Educational
Qualification: engineering electrical

Foundational Learning
Competence (FLC): panel wiring electrical

Residential
Address:103 rock view yeohvill/ jhbgauteng

Postal

Address: 103

Telephone (Home):

Telephone (Employer): 0113330171

Cell Phone

number: 0787675373

E-mail

[address:tshingombe520@gmail.com/tshingombekb@gmail.com](mailto:tshingombe520@gmail.com/tshingombekb@gmail.com)

Name and address of current

employer: stpeace college

Current

Occupation:engineering

OFO

Code: 0787675373

Trade test applying for

(trade title): engineering electrical tra

Specialisati

on: trade theory

Have you attempted a trade test previously? If yes, supply date and
Centre name

Yes	ye	No	
	s		

Centre

Name:st peace college

Date:

1	Trade test attempt no:
---	------------------------

Detail

s of Experience:panel wiring trade theory award

Attach appendix of outlining the scope of workplace exposure: Evidence in the form of testimonials, certificates of the Skills development provider detailing technical training completed certificates of service by employers or other persons of standing substantiating the training and experience referred to above must accompany the application.

Name and address of workplace	From	To	Detail of practical tasks
(a)st peace college	2020	2021	Panel wiring
(b)			
(c)			
(d)			
(e)			

Details of training - (Knowledge and Skills training). *Attach certified copies*

Original documentation must be provided with the application and the candidate must provide the centre with copies certified by a Commissioner of Oaths.

Name of Skills development provider	From	To	Course
(a) industrial installation ac dc machine / wire ways Engineering n	2021	2020	Electrotechnics Trade theory electrical
(b)			electrotechnology
(c)			Industrial electronic
(d)			instrumen

Note: Training and experience: (Give full details and exact dates)

Yes ☐ No ☐ Are you currently bound by a learner agreement?

Learner Agreement

No.:

Relevant

SETA:

Applicant's

Signature: tshi

Date: 10/11/2020

For Official Use	
Recommended for the Trade Test	YES
NO	
<input type="text"/>	
Trade test Serial Number:	
<input type="text"/>	

Trade test date:

Trade test Centre:

Accreditation number:

Receipt no:

Comments:

.....

.....

Delegated Person

Name:

Signature:

Additional Information (Compulsory)

The purpose of this document is to make the artisan trade test assessor aware of any medical condition in order to ensure the safety of the trade test candidate and the people around him / her.

MEDICAL INFORMATION

Please indicate by means of a cross in the appropriate space, as to whether or not you suffer from any medical disorder or allergy, e.g. high / low blood pressure, epilepsy, etc.

YES

NO

**If YES,
please**

state the nature:

YES

NO

Please indicate if you have any disability

If YES, please state the nature:

Gauteng department of education

June examination 2022 grade .time 2h hour page..master skills
assessment questionnaire.detail.mark.time minute. Skill master matric
question...

Trade theory electrical master skill phase trade note teach
intermediary.basic..elementaireseignor

Portofilio.investigation analysis knowledge assessment module skill
question value circular compare scaling weight mastering answering
questions formal Summative value matric statement.question dreaming
explain labell knowledge matric .. orientation industrial planing
knowledge synthesis questions answered research fundamental
formulation answers..trade theory electrical ..electrical technology logic
AC DC current machine low ohm . impedance..resonance.
researchreasoning..masteringrwiten CORRECT mastering circulars..

2.Education technology technical engineering trade theory. Educare
engineering phase elementaire fundamental knowledge criterion.
Intermediate seignor system control process teach lecture tutorial
councils research knowledge design didactic model psychology test
model development model sheet principle vocational AC DC current low

evaluation.oscillator resonance watch guidelines pedagogy model method
 presentation lecon plan classroom management director class care .
 knowledge directorate trade theory educare development care
 maintenance inspection compliance sabs low compliance know legs
 magnetic.. industrial electronic .module activity lecon ac .DC.curent
 machine motor transformation measures transmission module
 knowledge module fundamental assessment.frameworkbregulatory info
 system knowledge recruitment policy lecture patrol lecon plan .director
 planing school phasing modules subject faculte.

ID : EVALUATION SAQA APPLICATION 20191130002

_____ , 202001305040/ 201911130002

ID: N1-N2,N3/N4/N5/N6 , N 2010002023812 /
2004007064381 /2011007434332 NATIONAL EXAMINATION

HIGHER. EDUCATION QUALIFICATION

-FINAL AWARD (DEGREE / DIPLOMAT CERTIFICATE) SUBMITTED
1STH/

- NO PROVISIONAL CERTIFICATE OR UNOFFICIAL STEMETS

-CERTIFIE NO SUBMITE 1TH

-OFFICIAL STATEMENT FROM INSTITUT

- DIPLOMAT D'ETAT EXAM CERTIFIE / NO SUBMITTED

-ID: N1-N2, N3/N4/N5/N6, N 2010002023812 /
2004007064381 /2011007434332 NATIONAL EXAMINATION

- REGISTRAR CERTIFICATE NO: COM 18269001: /

- ST PEACE COLLEGE LEVEL N ENGINEERING CERTIFICATE
LEVEL 1,2,3,4, REGISTRAR CERTIFICATE NO: COM 18269001:

-FINAL DEGREE/ DIPLOMAT DEGRE SAQA N6 NQF 6/
NQF7 / NQF8 CONTINUE

- SAQA UNIVERSITY DEGREE 1, 2, 3, 4 NQF7/ NQF8 ,
SUPPLEMENTARY PREPARATORY SELECTOR DIPLOMAT

-REGISTRAR FEES: FINAL EXAM DIPLOMAT N / SAQA 50%

-REGISTRAR FEES FINAL

st peace college
filing

NAME/ LEARNER : TSHINGOMBE -TSHITADI

MODERATOR: MR BENJAMIN

ASSESSOR POL/ ENGI: MR JACSON

DIRECTOR: MANAGER /PRICIPAL: CONIE



ST PEACE COLLEGE / AND A I P

FACULTY : ELECTRICAL ENGINEERING

St peace college assessment

Engineering faculty.

Filing admission examination

Regular irregularity

Submission completed :

Filing number :

Affidavit number record investigator :

Statement. I'd number invigilator:

Submission number date time :

Level . National n.diplomat

Level national n5..certificate

Level national n 6.

1.Time table examination internal . .1.2.National trade examination
National engineering
Tech matric ncvs exam

2.Calender national technical vocational St peace college.

3.trade theory national examination time table :

4.Circulum policy matric n3.grade 12 final examination diplomat
syllabus

Subject.

Weighting scale .

DBE time table subject DBE syllabus matric teacher note books circulum

Subject .NCs trade matric

Subject: n3.n6 caps

N3 trade theory electrical .industrial /grade12 trade theory

Master skill teach note book matric

Assessment .topic activity presentation oral formal Summative
assessment

Exam saqa criteria school leavers

N3 /grade 12..orientation industrial)

N3/grade 12. supervisor industrial

N3/grade12.planing organization

N3/grade 12.mathematics

N3/grade12.engineering science

N3/grade12.economic businesses tourism

N3/ grade12.nursing health

N3/grade12..civilcarpentry build science

N3/grade12..mechanical .theory .diesel

N3/grade12..business English /basis English

N3/grade 12..educare . African

N3/grade 12..physic .

Na/grade12. Teach phase police traffic safety. security

Exam questions metric open book

Master skill engineering matric skill

Note teacher skill topic learner

Time table rwiten

Rwiten syllabus completed circular extra grade 12..completed

n3 integrity

Questions answering

Periodique phase teach lecture

Rwiten question papper internal .question papper .teach learner matric

phase circular board exercise book rwiten

..

5.time table national trade certificate diplomat technical .exam
labour licence qualifications
Level .
N1.n.2.n.3.n.4.n.5.n.6 examination syllabus theory practically national
trade examination
Subject trade theory examin certificate
Trade theory basic advanced.filing
Work labour skill trading book hand vocational guidelines circular
5.1.n1.n.2.n.3..4.n.6. Carpenterry examination subject wood work
engineering science Plante operation subject trade theory practice
syllabus
Master skill labourcarpenterry practical
Labour textbook sans sabs examination learning priority carpenters.
5.2nursing subject . Health promotion procedure health. Pathology
labour skill syllabus operational exam engineering clinic

5.3 brickline building science .level exam textbook manufacture relate
5.4.panel wiring electrical level trade they electrical .mathematics .
Textbook merseta textbook. Manufacture relate council engineering
science engineering
5.5.plumbing firing diesel mechanic
5.6.policing traffic theory national examination theory .
Master skill development trade theory electrotechmaster..trade hand
book examin national trade n trade nated 5.7orientation
industrial.supervisionplaningindustrial.organisation .
5.8.Development system it

Master. Master doctoral saqa NQF level 6.7.poste doctoral labour
relations bargaining engineering..

7..n1.n2.n.3.n.4.n.5.n.6 . Engineering trade national diplomat certificate
engineering time table short time full time table high education
engineering
7.1.Electrical engineering time table .
7.2.Mechanical engineering time table.
7.3.Civil engineering time table .
Engineering trading examination.and
Syllabus close book examin national engineering diplomat ..
Time table trade theory electrical engineering fundamental n basic
system system trade design process trade control trade fabric trade
engineering .. fundamental operational requirements trade syllabus
explained.

NQF engineering councils engineering trade council .councils education
Textbook engineering art creativity analysis investigation skill
Engineering licensed fundamental.system process fabric. Completed
exercise textbook. Resolve solve assessment engineering..
examination outcom entry exhibition time table

Level.n1.fundamental basic power engineering study . qualifications
 NQF.1.2.3.4.5.6.7. invigilator investigator
 Textbook questions explanation
 Career system advanced machine...control process..projet fabrics
 Certificate.
 Institutor engineering framework regulatory engineering..

Irregularities center poor rwong policy rwong framework regulatory...

8.educator technology technical .phase assessment inspection tutorial
 lecture ..
 Ergonomics psycholmetric .intermediary elementary seignor teach
 fundamental
 Maintenance care .health development engineer abet caps ..
 irregularities
 Teach trade theory elementaire phase trade and fundamental trade
 theory industrial circulum ..intermediary trade and system process trade
 phase ..seignore trade basic teach design teach daily plan and
 engineering daily planing working low mastering
 Subject educare and engineering
 Business low career and engineering workshop place..
 Professional.professor tutorial counseling vocational.principle .NQF
 Educare n4.n4engin labour n4.
 Subject ..lecture
 Research TVET lecture doc n7...

Poe verification coverage

Designing model didactic

1.subject /assessment task//mark allocation///content average////student
 programmer////

2.electrical trade theory . electrotechelectrotechnolgy, mathematics ,
 engineering science physics engineering, engineering science.drwaing
 /assignment//310,302,1000,module safety . studentprogrammer.week
 study completed

!!!!Engineering processing design low requirements allocation synthesit
 verification task . sequencegov item 3month 6minth progress

Subject/term 1//term2//total

1.Evidence low organisation supervisor planning

1 .2. Low: supervisor and management product labour low

educareeducationelintellectuel care low didadic

Low: engineering final process business engineering career natural low
 psychometric phenomenon.

Deputy TVET marketing motion policy low framework regulatory
 mandate irregularity engineering trade reports 190.

Low system development code line Colum matric vertical value..

Low assessment portfolio documents wallet flic floc timer compare
 electronics mail disclaims posted Relais communication ordering address

policy security.message posted officer system cloud protection
documents missing documents assessment address postal.
Low policy engineering information management system vsiplylowgov
skill administration low implementation system LRA relation labour
Low union police bargaining Ccma low binary information electrocompt
onus balance low.
Low test humain resource bpolicy induction learner motor industry skill
Low safety police security Union btrade theory electrical gov machinery
labour health license commission compliance installation EIC low safety
Anand commission motion low safety amand EIC sabs gov framework
TVET low compliance training.
Low engineering from electrical rescission power and information
intelligence non compliance restrain trade database.material hardware
systems in components electrical delay.egineering system process
development

Low recreation designing low communication system cloud policy
information management system licensed jurisdiction term regulatority
10142-1size minimum 10°000max Portofilio docket system build
database relay gate door home control room .space network geotech
limited not traffic design try low access control .
Low synchronisation asynchronous information library algebraic system
motion rescission safety policy electrotechelectrotechnolgy fundamental
power achieve value Poe refund system development cloud police record
of legal rescission it rescission engineering recreation trade unions policy
procedure labou missing fault dismissed scam spam criminal schedule
officer.commission EIC cebec bible ..

Police resolve crime admni information final
Administration learner registration attandanceinvigy learner filing
attandancefacitator.learner reward information pay attention.

Low Poe evidence police operational principal low command and control
and of land army assessment police operational detention.operation
enforcement compliance assessment offence defense patrol methods
investigation criminal interview and low enforcement.vrrification
enforcement traffic control potential cause determine land
record.evidence collection item recommend framework verification
subject industrial electronics module electrotech engineering science
module allocation mathematics n1.n6..
1.system engineering process management low system process overview
required analyse allocation design synthesis verification.wprk break
down structure configured

Integration cost and function allocation primary task define sequence
functional gov item planning work cost [prior.work](#) breakdown electronics
system hardware softward data measure test measure support system
header switching defense business systems quality long.life..
Verification system engineering fundamental low to explat power
distribution system electrical noise communication system bonding shield
group safety lightning discharge fault protection communication marking
priority output physical architecture product elements decision
databases input function archicad enable ipts decision
databases.autimate control constrain.
Verification.low evidence thermo electrical coding operational
manufacture performance vs current max value DC vs pump power
supply of the manufacture comparison of two tech control linear vssm
coding system heating pump vs current controller compare ovarall
energy design process thermo electrical estimate interactive byeat
parameter power heater rejected vs current load power dissipated dq/St
heat rejected vs current allocation function constrain synthetic system
elements alternative assessment technology ..
//)Poe evidence low mathematics rules low term monomial binomial
trinomial polynomial factorisation.log sign sum low differential.product
quotient low addition subtraction.multiplication.division.low of
exponential power low trigonometric angle triangle algebraic identify.low
limited low continuity function reasoning low derivative function existing
relation.low identify trigonometric.exist.low of integration...
///Poe evidence low physical engineering low system international low
symbol name unit name of law relate meter kilograms litre Newtown
kilograms lows Pascal amperage ohm watjoul Celcius kelvin.voltage meter
per second.second kilometres voltage per square metre.henry.faad.herz .
Evidence low static kinematics.dynamics.motiobreasoning.low force
required to accelerate $f \# m.a$ reasoning angular velocity
Low equilibrium anticlockwise.moments equals to clockwise
Low moment of cylinder volume
Low strength material magnitude area low.hydraulic pump $p=f/a$.
 $P=p.g.h$. ?... Low.. $PV=m.r.t$
Low hook expensive young module reduction low gravity force object
Newton..
Poe evidence low trade theory ..electrotech commission international EIC
sabs sans isocebec skill development engineer outcome AC .DC power
AC.dc.machineSerie exciting independent shunt compound load
operational design .
Characteristics load torque power motor single phase low low end
magnetic.low magnetic flux cutting a contact low wave mid ordinate rule
 $I_{ave}/g=i_1+i_2+i_3....!in/n$) $IRM=I$.
Low explain generating and supply power.low inductance of signle phase
over headline low capacitance directly proportionallow frequency
 $f=1/2\pi\sqrt{lc}$..
 $C=1/36 \times 08 \times \log_e(d-r)/r...$
Low input value power factor delta value low three phase delta
connection $power=I.(Re .\cos|+x\sin)x100$

Low connected alternator 1200 rev.low transmission line supply power
 reaction load.pf.linge voltage $E_o = V_P \cdot z_r / Z_a \cdot \cos / .r = R / z_r$,
 $S_2 \pi . t . (n_s _ nr) / 2 \pi$.
 Low power factor line current power $p = \sqrt{3} . I_L . \cos$.
 $P_1 = \underline{v l . i l} \cos(30+0)$; $\tan \pi = x_o / r_o$. $f = n . p / 60 \dots$ $E_o = n . \text{eff} / \sqrt{3}$. $Z_o = R + j i x \dots$
 Low induction motor $E = 2,22 . k . d . k p . z . | . f$.
 Poe evidence reasoning judgement low relate construction electronics
 industry components drwawing electronics switch connector schematics
 industrial circuit electronics logic. $z_t = 1 / z_1 + 2 / z_2 + 1 / z_3$.
 Low high information filter phase is oscillooscillator motion .low filter
 LCD.low stable voltage outcome.
 Low control voltage frequency counter low detector transducer bridges
 thermostable .low trigger circuit operational.low explain transistor fixe
 bias common emitter .
 Low explain make wath difference into divider bias $R_B . r_c . v_{be} . v_{ce} \dots$ device
 faulty labell.
 Low criteria oscillator irrespective of type wave produced frequency
 oscillator must stable amplitude output constant provision mode for
 positive feedback.low required timer 555precision functional
 monostable DC voltage converter.low operational amplifier
 audio .apvoltage.non inverter summing.
 Low have different ialVo(t) integration comparator..low instrument
 evidence Schmit trigger and test low type.
 Wath alternator difference integrator
 Attendance police theory trade..
 Formal test 1.2. level
 Resolve crime applied policing.on assessment policing engineering.and
 circular extra subject report learner
 Exam
 Test topic crime prevention..
 Assessment task according to the schedule.
 The assessment tools or instruction.rexord of marks
 1.Number of units/assessment/coverage
 2/formal written test)/one completed topics.
 1./interbak written exam /.)all completed topics .
 2.practical assessment coverage the related subjects outcom 2320..
 Knowledge and comphtension . application//.analysis synthesis and
 evaluation ...isat integrated Summative assessment btaskisat student
 cumulative.session

Exam n4-n6 and n diplomat inquired or umalusi for n3 n.1.n.2qcto
 resending documents examin irregularities evidence external national
 Irregularities n diplomat final engineering
 Time table/certificate n1/n/2/n/3/n4.n5.n6.n diplomat full time
 Statement certificate
 Result

Exam
Internal
Exam test trade council

Master. Master doctoral saqa NQF level 6.7. poste doctoral labour relations bargaining engineering..

7..n1.n2.n.3.n.4.n.5.n.6 . Engineering trade national diplomat certificate engineering time table short time full time table high education engineering

7.1.Electrical engineering time table .

7.2.Mechanical engineering time table.

7.3.Civil engineering time table .

Engineering trading examination.and

Sylabus close book examin national engineering diplomat ..

Time table trade theory electrical engineering fundamental n basic system system trade design process trade control trade fabric trade engineering .. fundamental operational requirements trade sylabus explained.

NQF engineering councils engineering trade council .councils education

Textbook engineering art creativity analysis investigation skill

Engineering licensed fundamental.ystem process fabric. Completed exercise textbook. Resolve solve assessment engineering..

examination outcom entry exhibition time table

Level.n1.fundamental basic power engineering study . qualifications

NQF.1.2.3.4.5.6.7. invigilator investigator

Textbook questions explanation

Career system advanced machine...control process..projet fabrics

Certificate.

Institutor engineering framework regulatority engineering..

Irregularities center poor rwong policy rwong framework regulatority...

8.educator technology technical .phase assessment inspection tutorial lecture ..

Ergonomics psycholmetric .intermediary elementary seignor teach fundamental

Maintenance care .health development engineer abet caps .. irregularities

Teach trade theory elementaire phase trade and fundamental trade theory industrial circulum ..intermediary trade and system process trade

phase ..seignore trade basic teach design teach daily plan and
engineering daily planing working low mastering
Subject educare and engineering
Business low career and engineering workshop place..
Professional.professor tutorial counseling vocational.principle .NQF
Educare n4.n4engin labour n4.
Subject ..lecture
Research TVET lecture doc n7...



TSHINGOMBEKB TSHITADI
<tsHINGOMBEBK@gmail.com>

Tue, Aug 9, 1:45 PM (5
days ago)

to
me

1.Reasoning for irregularities no submitted.
2.Reasoning judgement no filing dismissal
3.Reasoning method trade required meeting subject
4.Reasoning
Irregularity statement answered.

Irregularity affidavit answers sock
Irregulariti time table . engineering
Resolving assessment
Irregularity lecture
Irregularity meeting classes and faculty irregularity internal assessment
external
Irregularity inspection time period trade process duty career
investigation.invigilator .
Resolve crime assessment process way learner key learner attention.
Wrong policy meeting unresolved conflic
Wrong framework regulatory unresolved conflic policymentory wrong
policy inspection communication admnise skill .
Policy trial separet time table separate syllabus job career task outcom
department high efficiency..

Exam next step operation .rwong time table week daily engineering design irregularities principal and management schools policy..rwong registered attendance school fee no attendance learner no sign claim vsrwong registered bad meeting poor meeting record result released poor hand over checking.

Policy ncv ..policy national trade exam focus TVET no institutions school academic .policy rwong safety and security policy ...policy key no sepeate team time table holiday assessors challenge for..

T

Tue, Aug 9, 3:44 PM (5 days ago)

to
me

Institute and college assessment exercises book

1 .Time..08:00-08 -90/08:40-09-20/09:20-10:00/10:40-11:20/14:00/

2 .Week day :award certificate course assessment guidelines information guidelines orientation research . Engineering ass./ass test trade exam// assess information orientation assessment engineering exam /// information orientation assessment////information orientation assessment engineering////information orientation assessment.swmester 1 term 1.2.3.

3.week certificate : assessment engineering trade theory electrical, industrial electronics.mathematics ,physic engineering , engineering science drawing Engineering./trade theory electrical industrial mathematics physics Engineering // . Trade theory /// trade theory//// semester 2.term years 4.5.6

4.Week certificate:ass schools educare ,ass engineering.assessnated assessment test /...//...//...//...//...//semester 3.term .7.8.8

5.week certificate : assessor schools efuc ///.////.//// Semester .10.11.12 term

6.week certificate : schools engineering nated .. semester 5.yerm 13.14.16term

7.weel certificate: outcome diplomat

Week diplomat

Time table open outcomes /ass career award information orientation schools self assessmentexamant July December November/assessment orientation supervisor planing ass//ass com crime method regulatory info .. orientation EBM communication skill..ass plan paralegal m.t.discount term 18month..

Institute and college assessment award price recognised learner

_assessment award certificate course assessment

_assessment certificate diplomat

_a conduct assessment registered days

Learner allocation subject 5/4

_process low award diplomat instituts band college career learner lecture
 Regulatory 18month2year week presentation credits exercise
 Name/surname/I'd number/subject course/ time sign
 Tshingombe/Tshitadi.

Total record attendance award 18 months irregularities internal external
 on line presentation oral
 Facitator
 Information pay files irregularity documents system judgement report
 marke internal and external.analyse grid icass rubric material trade
 theory problem material learner solve station police

Time table subject course class studie engineering circulum assessment
 police and assesement engineering integrity exercise book note book
 completed system manueldisciplinairy learner conduct , manuel
 guideline orientation outcome / learner , inspect moderato ,

1 .Ti me	08:00 -08 -	- 90/08: 40-09	- 10:00 /10:4 0	11:20/ 14:00/	14/	14	14	14	
Wee	award	ass test	asses	informa	infor				Semes

k 1day 1	certifi cate cours e assess ment guidel ines infor matio n guidel ines orient ation resear ch . Engin eerin g ass	trade exam	s infor matio n orient ation asses sment engin eerin g exam	tion orienta tion assess ment/// informa tion orienta tion assess ment engine ering/// /inform ation orienta tion assess ment.s wmeste r 1 term 1.2.3.	mati on orien tatio n asses sment t///in form ation orien tatio n asses sment t engin eerin g///i nfor mati on orien tatio n asses sment t.sw mest er 1 term 1.2.3 .				ter 1.2 Term1 ,2,3
Wee k2 Day	Fram e work	Man syt,ass	infor	Ass infor,as	Ass.				semes ter
Wee k3	certifi cate : assess ment engin eerin g trade theor y electr ical	industri alelectr onics. Mathe matics	physi c engin eerin g	engine ering science drawin g Engine ering./	elect rot	Inst rul	pto tc		Term semm ester

Week4	certificate:ass school s educa re	ass engineering.ass essnated assess ment test	com crime metho d regul atorit y info	orienta tion EBM commu nicatio n skill	ass plan paral egal m.t.d iscou nt term 18mo nth..				term
Week5	orienta tion super visor planin g ass//								term
Week6									term
Week7									term

Institute and college assessment award price recognised learner
 _assessment award certificate course assessment
 _assessment certificate diplomat
 _a conduct assessment registered days
 Learner allocation subject 5/4

High education training.
Department training.
High education and training
Your examination number/usamenhonommer

.....
 Examination centre/Eksamenentrunk
 ..,.....

Subject/bank,.....level/...

First ..second .papers

For t paper.....date20.....

QUESTIONS/MARK/PUNTE///INITIALS////FOR REMARKING HERMERK

1/H.T.U/..M.SM.CM.////.HT U/E.INITIAL

1.

2.

3.

15.

TOTAL..

QUESTIO NS	MARK/ PUNTE	INITIALS	FOR REMARKI NG HERMER K		
	H.T.U	M.SM.CM	HT U		
1					

TOTAL..					

INSTRUCTION TO CANDIDATE REGARDS THE RWITEN OF THE EXAM
Department of higher education and training.
Republic of South Africa
ADMISSION PERMIT AND EXAMINATION TIME -TABLE.
50408782 N4: ENGINEERING STUDIES

(REVISED)
EXAMINATION NUMBER 2100002023812..ID
EXAMINATION CENTRE
899993812 SHALOM TECHNICAL CENTER .PTY LTD
AFRIC TRAINING

SUBJECT///PAPER ///DATE//// TIME
F8080074 ELECTROTECHNICS N4 EXTERNAL EXAMINATION
///1//20220201////9.000
F8080164 INDUSTRIAL ELECTRONICS N4 EXTERNAL
EXAMINATION///1//20220208////9.0
F15070434 ENGINEERING SCIENCE N4-EXTERNAL EXAMINATION 1
200220207//9.00
F16030164 MATHEMATICS N4-EXTERNAL
EXAMINATION/1//20220207.9.00
FULL TIME.P.
RE MARKING FOR REMARKING XHEING MUSTE SUBMITTED WITH 10
DAYS AFYER THE RELEASE OF THE RESULTS AT CD NEA ..
CANDIDATE ARE RESPONSIBLE TO ENSURE THAT THEY RECEIVE
THE CORRECT QUESTIONS PAPPER TO ENSURE THAT THEY RECEIVE
THE CORRECT QUESTIONS PAPPER.
N3 ELECTRICAL TRADE THEORY N3.2022. ..
ID 2004007064381/

Formal technical INSTRUCTIONS in the ra report 191..n n3. ..191..
I'd evaluation saqa application 2019113002/20200130540
Formal RSA 191. Assessment task the icass trimester engineering studies
.2010002023812/2004007064381/2011007434332..subject week
2,4//,5,6//8total 2test natural science engineering..
75 78 lecture day general business services lecture.

899993812 center St peace college n5/ n6 , 2100002023812..ID
revised

SUBJECT	PAPER	DATE	TIME
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F8080074 ELECTROTECH NICS N4	internal	20220/	9.00
F8080164 INDUSTRIAL ELECTRONICS N4/n5/n6	internal	20220/	9.00
F15070434 ENGINEERING SCIENCE N4/n5/6	internal	2022/	9.00
F16030164 MATHEMATIC S N4/5/6	internal	2022/	9.00
N3 ELECTRICAL TRADE THEORY			
INSTALLER RULES			

Analysis grid for all test and must be submitted for Pre assessment moderation..

Subject level learning objectives//questions/formative/short responses /medium response/extend response /mark

Subject level learning objectives	questions/formative				

Weighting: The following weights are consequently awarded to each category

CERTIFICATE AND DIPLOMAT ENGINEERING ELECTRICAL

Knowledge and Understanding	<u>APPLYING</u>	<u>ANALYSE SYNTHESIS EVALUATION</u>	<u>INVESTIGATION DISCOVERY/ DESIGN / ASS POL</u>	<u>TOTAL CRITERIA CLOSE</u>
<u>3--40</u>	<u>30-40</u>	<u>20-25</u>		
			<u>40 ,60</u>	<u>10 POINT SCORE</u>
<u>REQUIRED TASK OPERATION</u>				
<u>MATHEMATICS</u>				
<u>ELECTROT ECH</u>				

<u>POWER MACHINE</u>				
<u>ENGINEERING SCIENCE</u>				

STUDENT NAME : TSHINGOMBE TSHITADI

ID NUMBER :

ID DIPLOMAT NUMBER : ..Q

SHEET MARK SUBMISSION EXPLANATION EXAM

<u>MODULE /SUBJECT</u> <u>ELECTRICAL ENGINEERING</u>	<u>WEIGHTING</u>	<u>OUTCOM CRITERIA</u> <u>CREDIT CLOSE</u> <u>AWARD SCORE</u> <u>FINAL /QUALIFY</u>
<u>MATHEMATIC</u> <u>1.</u> <u>2.</u> <u>3.</u>	<u>100MARK</u>	<u>MIN / MAX</u> <u>100MARK</u>

<u>4.</u> <u>5.</u> <u>6.</u> <u>7</u> <u>.8</u>		
<u>ELECTROTECHNICAL</u>	<u>100MARK</u>	
<u>POWER MACHINE</u>	<u>100MARK</u>	
<u>ENGINEERING SCIENCE</u>	<u>100MARK</u>	
<u>ELECTRICAL ENGINEERING DIPLOMA / STATEMENT STATEMENT</u>	<u>400MARK /</u>	<u>400 MARK</u>
<u>RATING</u>		

SCHEDULE CASE REGISTRAR ATTATNDANCE RECORD SHEET
AMANDEMENT TEXTBOOK WEEK COMPLETED COVERY ,
INVIGILATOR, AMANDMENT COPYRITH DARLO. / N1-N3////N4-N6

NAME SURNAME	WEEK /PRESENT ABSENT	ID NUMBE, TEXT BOOK NUMBER ISBN	CELL PHONE /TIME/IN OUT	SIGN

allocation /Toalmark.multiple choice medium response short explanation
description required a couple's of sentences .extere response long
explanation required.pre assessment moderate process lecture response
settings a test assessment task.pre assessment.. responsibility time hod..
subject lecture trimester semester manage due.technical criteria content
coverage..final approval of the assessor check layout font submit..
analyse grid.1.2subject aim learner objects are listed.conceptual visual
level indicator per questions instruc.spreadconcept..formal cleared
correct check page break spacing criterion content..content lecture
subject assessment file item file.class registered subject syllabus work
schedule plan work plant pace .plan lesson and teaching resources.
Evidence of additional support task as required improve.munite of
subject meeting.does does the assessment file
containing,.moderatorreport.evidence of post assessment moderate
handwrite or ... subject.level.program drop total.percentage total plane ..
trimester assessment task tool content duration mark moderator
submission date Pre assessment.assement date completion date of post
moder..

1.Subject. Years.... trimester ..

icass trimester mark sheet..Cass mark task

.final icassmark..test..test convent the mark to weighted /%total 100..

Irregularity..forfeitresultat be suspended from writing exam for 11month..examadmission permit and examination

instructions....

Check.

Task efficiency time management..standardrequired.correctly per the standard required.4_5. Required struggle management organisation completed..correct task standard.

Task criteria possible weight area..

Evaluation is conducted continuously means two formal test college test mark 40bfinal exam electrotech engineering

Knowledge and understanding., applying, analysis synthesis and evaluation. Rwritten

Information processing n5.n.6

..guidy marking.

The candidate cannot fail because could not completed or pass the timed accuracy.

Total questions Papp ..pepetive accuracy process errors must indicated red repetitive accurate..

All key.

Method marking..possible mark .if only 1/4of questions is completed original mark will be used for marking of questions complex originally..

Mark for all the question .row mark diverse by 3..

Questions continued.

Total mark .= $50 \frac{1}{2}$ = accuracy =40

Display=10..becomes full mark ..

2.computer practice

Database documents the doc save.diagram chart. Show step step.

Diagrams the represents an Lgorith.

The boxes are connected by line arrows.can give step problems.

Organisation structure of a company.

Structure not .

Process operational brepresented .

Connecting arrountflow .

3.sectionm basic principles of law .

Section b account.

Commission structure

Non national certificate installations rules second pepper
time
:3hours .marks 100.

1. Answer all the questions
 - 2.read all the questions carefully.
 3. Number the questions according number.
- Even though explicit started in question.all the questions carefully.
Number..sabsdan.aswr word perfect .

Final revised time table Engineering studies examination 2020..
N1..n4electrotech industrial n1...

High education and training.department high education and training

Republic of South Africa ..TVET St peace college.

National certificate.

Engineering

**Code. Test 1/ 2 examination coverage work home work class
work assessemself completed**

April July August .. November

N6..N5

TIME :3HOURS

MARKS:100

INSTRUCTIONS AND INFORMATION.

- 1.answer all the the question .
- 2.read all the questions carefully
- 3.number the answers according to the number system used Ind this question papper
- 4.sketch must be larger neat and fully labelled
- 5.keep subsection questions together.
- 6.star each question with the formula and substitute value.
- 7.round off each final answer to three decimal.
- 8.write nearly and legibility.

Questions 1. Define of the term

1.1.1

1.1.2

1.1.3

1 1.4

1.1.5

Questions 2.completed the following sentence by writing the missing word or words next to the question number.

1.2.1

1.3 name two source .of

1.4. study diagrams below

1 .4 .2. wath is used of the apparatus show in the diagram.

1.4.3. briefly explain the result of the process of the process shown in the diagram.

Questions 2

2.1 given:

2.1.1 what is the formula used for?

2.1.2 given the mean of the symbol in the formula

2.2 .if the gas consta r of fax is j/kg and pressure of. Mmmhg boiling of water .

2.4 briefly explain the difference between

2.4.1

2.4.2

2.5 study the question below and answer the questions.

2.6.Calculation the value fundamental and.

Questions 3.

3.1 list four factor that influence the amount of eath

3.2

3.4.

Calculate

.3.5.

Questions 4.

4.1state low of

Dream a diagram

Department of higher education and training
republic of South Africa national certificate .
TVET St peace college.

.examination hi
Mathematics n.5.n.6
Time :3Hours

INSTRUCTIONS and information.

- 1.answer all the questions.
- 2.read All the questions carefully
- 3.number the answers according to the number system.used in this question paper.
- 4.all final answer must be rounded off to three decimal place.
- 6.question may be answered in any.but subsection of questions must be kept together.
- 7.use only blue or black ink.
- 8.write neatly and legible.
- 1.1 determine the following limited
- 1.1.1 $\lim_{x \rightarrow \infty} e^{-2x}$

- x_0
- 1.1.2 $\lim_{x \rightarrow 0} (\sec x - \tan x)$
- 1.2 determine whether $f(x) = x^{-2/3}$ is continuous at $x = -3$
- Questions 2.
- 2.1 determine the derivative of $f(x) = \cos x$ from first principles
Hint: $\lim_{h \rightarrow 0} \frac{\cosh - 1}{h} = 0$; $\lim_{h \rightarrow 0} \frac{\sinh}{h} = 1$
- 2.2 determine $\frac{dy}{dx}$ in each of following cases simplified is
- 2.2.1 $y = \cos(x-4) + \cos(x+4)$
- 2.2.2
- 2.2.3
- 2.3 determine $\frac{dy}{dx}$ with the use of logarithmic differential if..
 $\text{Arc}(\sin x) = x$
- 2.4 given $3x^{xy} = 2$
- 2.4.1 determine the slope $\frac{dy}{dx}$ of the tangent at the point (1;5)
- 2.4.2 hence, determine the equation of tangent at point
- Questions 3.
- 3.1 given $f(x) = x(x^2 - 5) - 4$
- 3.1.2 verify using table
- 3.2 two side rectangular length at rate 3cm/s. 50 cm..
- 3.2.1
- 3.2.2
- 3.3 a particle move in straight line according to the distance formula.
 $S(t) = \sqrt{t}(3 - 3t - t^2)$
- 3.3.1 calculate the velocity of the particles after 3.5 seconds.
- 3.3.2 calculate the acceleration after 2 seconds.
- Questions 4.
- 4.1 determine $\frac{d}{dx} (e^x + e^{-x})$
- 4.2 determine $\frac{dy}{dx}$ in each of following cases:
- 4.2.1 $y = \sin \sqrt{1 + \cos x}$
- 4.2.2 $y = x \cdot \sec x$
- 4.2.3. $Y = \cos 6x \cdot \cos 2x$
- 4.2.4. $Y = \frac{2}{3} + 4x$
- 4.3. Determine $\int y dx$ by using the integration into partial fraction:
 $y = \frac{x^2 - 2}{x^2 - 1}$
- 4.4 determine $\int \frac{x}{x^2 - 5} dx$
- ..
- Questions 5.
- 5.1 given the curves $f(x) = \sqrt{16 - x^2}$ and $g(x) = 4 - x$
- 5.1.1 calculate the magnitude of the enclosed area
- 5.1.3 calculate the volume when this area rotate about the x axis.
- 5.2 prove that $\int_{-\infty}^{\infty} e^{-st} dt = \frac{1}{s}$

Questions 6..

$\frac{dy}{dx} = \tan y \operatorname{cosec} x$

6.2 determine the particular solutions of the differential equations

$\frac{dy}{dx} = \frac{1}{2x} + \frac{3}{2x} + \pi$

For which $y=2$ and $y=-3$ when $x=1$.

Total 100

marks 100.

Compare

Scale $100 \times 2/2$

Explanation fundamental core value mark.

Weighting fundamental demonstration knowledge analysis synthesis mark point

Formula sheet value .

Defense purpose value factory development system.

Assessment police circular reasoning

Statement.

Department of higher education and training
republic of South Africa. ..St peace college
National certificate
Electrotechnic n5.n6../
Time 3 hours
Marks:100

INSTRUCTIONS and information

1. answer all the questions .

2. read all the questions carefully.

3. number the answers according to numbering system used in this question.

4. write neatly and legibly.

Questions 1.

1.1 state two methods of changing the direction of DC machine.

1.2 where are the compensation windings situated and how are they connected?

1.3 the number of series turns per pole required on 355 kWh long shunt compound generator must be determined to enable it to maintain a constant voltage at 580V between no load and full load . without any series

winding, it found that the shunt current has to be 6A on no load and 7,5 on full - load, to maintain the voltage constant at 580v. number of turns per pole on the shunt winding is 2100.

1.3.1 calculation the demagnetising and cross-magnetising ampere-turns per pole

1.3.2 if the series coils were wound with 12 turns per pole and had a total resistance of 0,08 ohm determine the value of diverter resistance that would be required to give level compounding

1.4 A 625v, 35kw, four-pole DC motor has a wave-wound armature with 900 conduct and the commutator has 180 segment. the full-load efficiency is 85% and the shunt current is 2,25A. The brushes are shifted backwards through 1,5 segment from the geometrical neutral axis.

Questions 2.

2.1 the voltage across a certain circuit element is

$$v(t) = 800 \sin(314t + 30^\circ) \text{ V.}$$

The current flowing in this element is $i(t) = 8 \sin(314t + 30^\circ) \text{ A}$.

2.1.1 the nature and magnitude of this element.

2.1.2 the time period of the waveform.

2.2 circuit consisting of a coil with an inductance of 140 micro Henry and resistance of 8.25 ohm is connected in parallel with a variable capacitor. this combination is connected in series with a resistor of 7300ohm across a 380v supply having frequency of 1mhz

Calculate:

2.2.1 the capacitance of the capacitor required to give resonance.

2.2.2 the impedance of the parallel circuit.

2.2.3 the current in each branch of the parallel circuit.

Questions 3.

3.1 name three methods of reducing leakage flux in transformers.

3.2 A 24 KVA, 3 200/800 single -phase transformer, operating at no-load has the following resistance and leakage reactances.

Primary winding: resistance 8,4ohm reactances 14.4ohm

secondary .resistance 0,75 ohm reactances 1,5ohm

Calculate the secondary voltage at full load with a power factor of 0,8 lagging, when the primary voltage remaining constant.

3.3 three similar inductor, with a resistance of 29ohm each and inductances of 0,038h are connected in delta to a three - phase ,535v,50hz sinusoidal supply.

Calculate

3.3.1 the value of the line current.

3.3.2 power factor.

3.3.2 power input to the circuit.

Questions 4.

4.1 the input power to a 2950v three- phase delta- connected induction motors is 135kw..the power factor the motor is 0,85 lagging.

Calculate:

4.1.1 the line and phase currents

4.1.2 input power reading on the two watt-meters

4.1.3 KVA rating of the motor

4.2 A three-phase transmission line supplies a 1,73 me stat-connected load, having a power factor of 0,85 lagging at a line voltage of 35kv.

The line has a resistance of 85 ohm per phase and an inductive reactances of 155 ohm per phase.

Calculate:

4.2.1 voltage (line) at the sending and end

4.2.2 the per unit regulation

4.2.3 efficiency of the line

Questions 5.

5.1 explain the term hunting or phase swing with reference to synchronous motors.

5.2 A three -phase slip-ring induction motors gives a reading of 96v across the slip- rings on open circuit with normal stator voltage applied. the rotor is star connection and has an impedance of $0,7+j9$ ohm per phase.

Calculate the impedance:

5.2.1 at standstill with the slip-ring joined to a star connected starter with a phase impedance of $4+j7$ ohm

5.2.2 when running normally with 5% slip.

5.3 a three-phase induction motor with a star- connected rotor, has an induced EMF of 145 v between slip- rings a standstill on open circuit. the rotor resistance and reactance per phases at standstill is 1,25ohm and 6,75ohm respectively.

Calculate the following when the slip - rings are short - circuited

5.3.1 the rotor starting current per phase.

5.3.2 the power factor.

5.4 A three-phase star-connected alternator. driven at 1200 rev/ Min. Is required to generate a line voltage of 885 vat 6..open circuit. assume full full pitch the coils and the stator has 8 slots per pole per phase and 6 conductor per slot ($KD=0.96$)

Calculate.

5.4.1 the number of poles

5.4.2 the useful flux per pole.

Total 100marks..

Explanation oral presentation. Topic research find

Assessment circular

Defense factor . Fundamental law demonstration low answers regular attendance verification.

critical assessment eng

Knowledge explain text book reference

Analysis discovery

Planer

Criteria outcome value reasoning Min max..50mark

Department of higher education and training
Republic of South AfricaTVET St peace college.

National certificate
Industrial electronics n5.n6.
Marks: 100

INSTRUCTIONS and informaton.

- 1.answer all the questions.2.read all the questions carefully
- 3.number the answers correctly according to numbering system used in this question papper.
- 4.keep questions and subsection of questions together.
- 5.all the sketches at diagrams must be large .clear and neat.
- 6.show all the steps and calculations.
- 7.write neatly and legibly.

Questions: alternating current theory

1.1 draw the circuit diagram of a RC-coupling and show typical inputs - and output waveform of the circuit.

1.2 low and high frequency disturbance can be observed from different level of a square test waveform. Different level of square test waveform. Show the level involved by means of a neat sketch.

1.3 in a parallel RL-circuit $R=20\text{ ohm}$, $L=0,01\text{mH}$. and $V_T=20\text{v}$, 100khz . Calculate:

1.3.1 Z_T (answer in polar form)

1.3.2 I_T (answer in polar form)

1.3.3 I_L (answer in polar form)

1.3.4 I_R (answers in polar form)

Questions 2: power supplies

2.1 A power supply makes use of a bridge rectifier and a simple capacity filters the following values of the circuit are known:

$V_{Dc}=12\text{v}$, $R_L=100\text{ ohm}$, $f=50\text{hz}$ before rectification.

2.1.1 C if the ripples factor is 3%

2.1.2 cm across the bridge rectifier

2.2 A 500mw, 10 v Zener diode is used in voltage reference source.

If the maximum supply voltage is 16v, calculate the value of the series resistor in order to protect the Zener diode.

2.3 draw a neat labelled circuit diagram of a high, stable, adjustable power supply. The circuit must use of a regulatory components and operational amplifier.

Questions 3: transistor amplifiers

3.1 state three factors which causes a variation on the collector current of a transistor because of a varying temperature.

3.2 the following values of a common emitter amplifier is known:

$R_{b1}=15,97\text{k ohm}$, $R_{b2}=3\text{k ohm}$, $R_E=120\text{ ohm}$.

$R_C=480\text{ ohm}$, $V_{CC}=12\text{v}$, $V_{BE}=0,7$ and $\beta=250$

Calculate the value of I_B , I_C , V_{CE} and V_B of the amplifier (assume the transistor is made from silicon type material).

3.3 calculate the input impedance Z_i and the output impedance Z_o of the circuit in

question means of the appropriate method if:

$h_{ie}=1,2\text{kohm}$; $h_{re}=2 \times 10^{-4}$; $h_{fe}=100$ and $h_{oe}=20\text{ micro amper /volt}$ ($R_s=0$)

Questions 4: operational amplifiers

4.1 explain the term drifting as applicable to operational amplifiers

4.2 draw a neat, labelled circuit diagram of an active high -pass filter with unity gain.

4.3 calculate the -3db frequency of the filter in question 4.2 if both capacitors have value of 0,1 if while both resistor have value of 1 k ohm

4.4 draw a neat, labelled circuit diagram of a practical operational integrator.

Questions 5: integrated circuit.

Indicate whether the following statements are true or false. Choose the answer and write only true or false to the question number (5.1-5.3) in the answers book.

5.1 CMOS-integrated circuits have high noise immunity.

5.2. CMOS - integrated circuits are susceptible to static charge because of their low reactive input

5.3 when one works on a circuit with CMOS-Integrated circuit on it, the power supply to the circuit must be switched off.

Questions 6: transducers.

6.1 draw a neat, labelled circuit diagram of a thermistor control circuit that makes use of an operational amplifier and a dc-wheatstone bridge.

6.2 if the bridge in question 6.1 is balanced at 25 degree.

$R_T = 10\text{ k}\Omega$ at 25 degree Celsius.

$A = 0,2169$

$\beta = 3200$ and a 10 V battery is connected across the bridge, calculate,

6.2.1 the value of the thermistor at 30 degree Celsius.

6.2.2 the gain of the amplifier with an output of 10V.

Questions 7: electronic phase control

Draw a neat, labelled block diagram of a phase control circuit that makes use of two silicon controlled rectifiers for full-wave AC - control. Also show the trigger and load waveform at a phase angle 90 degree.

Questions 8: test equipment

Draw a neat, labelled circuit diagram of an R-C phase shift oscillator.

Calculate the values of the resistor if the [oscillating frequency is](#) 50 kHz and the capacitor value is 10 nF.

9.3 draw a neat, labelled circuit diagram of a Schmidt - trigger

Department of higher education and training

Republic of South Africa

National certificate

Engineering physics N5/N6..

Time 3Hours

Marks 100.

INSTRUCTIONS and information

1. answer all the questions
2. read all the questions carefully
3. keep subsection of questions together.

Questions 1

1.1 description examples of diffusion in:

1.1.1 solids

1.1.2 liquids

1.1.3 gases.

1.2 a spaceship on its way to the moon reaches the point where the moon and the earth exert equal force of attraction on it.

calculate how far this point is from the earth. The distance from the moon to the earth is 4×10^8 m

1.3 calculate the osmotic pressure of a sugar solution that rises 200 mm in the tube of a funnel, when the sugar solution has a density of 1.5 g/cc.

1.4 the statement below refers to the given diagram showing the meniscus of a liquid in a thin glass tube.

Indicate whether the following statements are true or false. Choose the answer and write only true or false next to the question number (1.4.1-1.4.3) in the answer book

H

1.4.1 cohesion is greater than adhesion.

1.4.2 the liquid in the tube could be mercury (not water)

1.4.3 the angle between the surface of the liquid and the container is more than 90 degrees (alpha more 90 degrees)

Questions 2

2.1 after the pressure on a quantity of gas was increased adiabatically from 250 kPa to 2.1 MPa the volume was 5.8 m³ calculate the original volume of the gas

2.2 A 200 m length of black polythene pipe of 50 mm external diameter is connected to the inlets of a swimming pool pump while the water is circulating. Assume that no energy is lost the mass of water in the system is given as 20000 kg the pipe is black and is at a constant temperature of 60 degrees Celsius. The sun shines directly perpendicular on the pipe for 8 hours. Assume that the sun is only in contact with half the pipe for 8 hours. Assume the sun is only in contact. With half the surface area of the polythene pipe emissivity for black = 1.

Calculate the following

2.2.1 the area of the polythene pipe absorbing energy from the sun

2.2.2 the rise in temperature of the water in the system

2.2.3 the energy absorbed by the polythene pipe

2.3 write a paragraph on the conduction of the heat discussing the medium involved and the role molecules player on the process.

2.4 explain the meaning of and give the si unit for each symbol in the formula below:

$$V = \sqrt{3R_0T/M}$$

2.5 calculate how much work is performed by a gas which initially has a volume of 0,003 meter and the temperature of which rises from 27degree Celcius to 227degree if the pressure remain a constant at 2×10^5 pa

2.6 a neon light tubes work from 250 v and drawing a current of 0,48 the tube has surface...area of 0,302 meter square and has a eorki temperature of 50degree celciy.

If $e = 0,25$ calculate the following:

2.6.1 the electrical energy available in watts..

2.6.2 the heat energy loss..

2.6.3 the light energy radiated..

Questions 3

3.1 calculate the magnetic flux density at a point..at a point when a current of 6 A is flowing through a circular wire..of 30. Cm diameter. P is the centrecentre of the circle.

3.2 a transformer has 2400. turn on the secondary side and delivery s 600.v calculate the turn ration (primary secondary if the supply voltage is 220 v.

3.3 a current _ carrying conductor 0,5 m long, moves at 0,2m/s perpendicular to a magnetic field of 4 Tesla (WB/m) the resistance in the conduct is 4 ohm calculate the following:.

3.3.1 the induced EMF.

3.3.2 the current through the conduct.

3.3.3 the force on the conductors.

3.4 description the difference between the construction of a generator and of an alternator.hoe do you distinction between them in term of current.

3.5 completed the following sentence concern the construction of a galvanometer using any of the following suggestions [material.in](#) the list below.

Copper,softiron.nulon.aluminium

3.5.1 the moving coil made of fine wire.

3.5.2 the coil is wound around a cote..

3.5.3 the framework, within which the coil is held, is made of

Questions 4.

4.1 .4.1.1 wath is the processing called when molecules diffuse through a sermipermeable.membrane

4.1.2 describeda appropriate example of the process in question.

4.2 an iron ball of diameter 16 cm and a mass of 14kg is suspended 3m from the floor by an iron wire iron wire of outstretched length of 2,8m the diameter of the wire is 0,9 mm if the ball is set swinging a downward force of 260n is exerted by the the ballast it's lowest point by how much does it clear the floor ? Young module for iron $= 1,86 \times 10^{11}$ pa

4.3 an Observer at the blood donor service notice that blood rises 6,8mm on a tube with a 1 mm diameter

Calculate the density of blood if the surfaces tension is given as 0,02 n/m and contact angle is 5 degree

4.4 ammonia had a molecular mass of 17 kg / mol and diffuse at a rate of 0,222l/Min

Calculate the rate of diffusion of carbon monoxide gas with a molecular mass of 28kg/mol

4.5. write short notes on

4.5.1 adhesion

4.5.2 cohesion

4.5.3 viscosity

Total 100.

. explanation.

Information processing n5.n.6

..guidy marking./ tst 1. 2

The candidate cannot fail because could not completed or pass the timed accuracy.

Total questions Papp ..pepetive accuracy process errors must indicated red repetitive accurate..

All key.

Method marking..possible mark .if only 1/4of questions is completed original mark will be used for marking of questions complex originally..

Mark for all the question .row mark diverse by 3..

Questions continued.

Total mark .= $50 \frac{1}{2}$ = accuracy =40

Display=10..becomes full mark ..

2.computer practice

Database documents the doc save.diagram chart. Show step step.

Diagrams the represents an Lgorith.

The boxes are connected by line arrows.can give step problems.

Organisation structure of a company.

Structure not .

Process operational brepresented .

Connecting arrountflow .

3.section basic principles of law .

Section b account.

Commission structure

Department of higher education and republic of South Africa
National certificate

Fault find and protective device N5

Time 3hours.

Marks: 100

INSTRUCTIONS and informaton

1.answer all the questions

2.read all the questions carefully

3 number the answers according to numbering system used in this question paper.

3 .writing neatly and legibly.

Statement question answering true or fals make papper verification Questions 1.

Designi and drawing only the control circuit of the following sequence start:

Press start button -motor A

After 10 second motor b stars after another 10 second Motor a stops..all the coils are 380 v and the timer are set 10 second.

Note : show all the protection and safety equipment.

Questions 3

3.1 name two type of voltmeter commonly.use in practice.

3.2 draw a simple block diagram of a digital voltmeter.

Questions 4.

4.1 make a labelled freehand drawing of the general diagram of feedback amplifier.

4.2 convert the following number to the base show in brackets

4.2.1 48

4.2.2....10111,011

4.2.....8,4375.

Questions 6

6.1 Draw and labels the symbol and consideration of an act.

6.2 draw a labelled vi character curve of an act.

Questions 7

The figures on the diagram sheet attached show that contractor M does not pull in

Questions 8.

8.1 wath is x-y plotter

8.2 state four advantage of the x y plotter

8.3 name four feature of the x -y plotter.

Questions 9

Define the following :

9.1 slip - ring

9.2 primary (of an electrical machines)

9.3 .segment

9.4 stator

9.5 squirrel cage rotors

Questions 10

10.1 explain how dynamic braking..used to decelerated..a direct - current Motor.

10.2 explain why you cannot start a large direct current motor without a starter..

1500kg of water from 10 degree to 40 degree assuming 75 % efficiency to account for heat transfers the surrounding the. Of electricity is 9 cent kW

Given

$.1500 \times (40 - 10) = 54000$

Eff 75%. = 72000kW

Unreasonable result what current is head to transmit 100x10mw of power

At 480 v..(by transmission line if they have 100 resistance.

What is unreasonable about this resi.

Which assumption are unreasonable.

Department of higher education and training
Republic of South Africa
Non national certificate installations rules second paper
time
:3hours .marks 100.

1. Answer all the questions
 - 2.read all the questions carefully.
 3. Number the questions according number.
- Even though explicit started in question.all the questions carefully.
Number..sabsdan.aswr word perfect .
7. Candidate must pass paper 1 and paper 2.with 50% each.both examination write. During the same exam period must be pass 12 month
otherwise re write.. statement of result issue for accreditation purpose
statement of results will be issued candidate meet prescription of the
labour .use pen black.

Questions 1. SANS 10114-1 2017 installation requirements current
carrying capacity of conductor and cables. Six cables of the same size
installed on metre deep in a trench that has an average soil temperature
of 30 °C each cable sustain current carrying capacity of 66.52A.and
thermally resistivity of the soil is 0,9 km/W there is not space between
cables.

1.1 Calculate the standard rating of each 1.2.cable installed in pipes and
buried in the ground.

Questions 2; SANS 19142-1 of 2017 installation requirements installation
of conductor and cables .

3.1 What are the identification for a conductor.

2.2 state eight instance where PVC insulated multicore cable with a
bare Earth conductor and cable with metal stiffening may be used .

Questions 3. SANS 10152-1 of 2017 installation requirements: distribution
boards.

Briefly explain the requirements regarding warning label that shall be
fitted to all distribution board.

Questions 4

SANS 10142-1 of 2017 verification and certificate prospect short circuit
current.

4.1 give the formula to calculate the source transformer and explain each item formula.

4.2 calculate the estimated length of 70mmx4core aluminium cable with an impedance of 0,0263 Ohms

Questions 5 sans10142-1 of verification and certification testing.

. Briefly explain how following test can be performed:

5.1 continuity of bonding.

5.2 resistance of the earth continuity conductor.

5.3 voltage. Available load (worst conditions)

Questions 6: sans 10142-1 verification and certificate test reports..

6.1 state three test reports applicable to this of sans.

6.2 name four of the five type of electricity supply system mention in section 2.(Installation of the test report typical of electricity supply system mention in section installation of the test report.

6.3 state five electrical test that can be performed at the distribution board .with supply available and can only be performed using a test.instrument.

Questions 7 sans10142-1 of 2017. Installation component. Install fixed electrical installation .

Questions 8. Sans 10142-1 of 2017. Calculation of voltage drop.

Calculate the following from the diagram.

8.1 the estimated cable size between the transformer and the db.the no load voltage measure at the db is 225v.

8.2 the maximum distance allowed between the db and the pump.

Transformer 11kv/230v 0.9pf single phase....20 m ..distribution board 80 a 225 v no load ..4mm x3 Coren..pump 1 phase 5kw/230va..

Questions 9. Sans 1014 of annex earthing arrangements and equipotential bonding of information technology installation for functional purpose.

State the conductor that may be contained to the earth busbar of information technology installation.

Question 10:..sans 1973-3 of 2008; safety of assemblies with a rated prospective short circuit current of the up to and including 10 kA: busbar and wiring system ..

True false

10.1 the current density of phase busbar shall not exceed 2,0 A/mm for busbar current up to and including 630A.

10.2 the sizes and designs of phase busbar shall not exceed that could occurred at the supply terminal of assembly.

10.3 standard colour coding. Red yellow blue or number L1,L2,L3, shall be used to identify a phase busbar

10.4 green /yellow shall be used for the earthing busbar and black for the neutral busbar.

10.5 if colours is used for control wire coding any colour may be used except green yellow and green black..

10.6 electrical equipment shall be selected in accordance with the used technical and installation knowledge for enclosed assemblies.

10.6 electrical equipment shall be selected in accordance with the user technical and installation knowledge for encode.

10.the power loss lead dissipation capability of the assembly may be exceeded if monitorer.

10.9 the dimensions of the joining plates (fish plate) of the busbar shall be similar to those of busbur and the overlap on each side shall be at least equal to the width of the busbar..

10.10 conductor installed within a fault free zone need not be insulated where they could touch conductive parts..

Installation component stand fixed electrical

..from the point of control to the point of consumption..stove coupler socket wall nice vc switch .isolation transformer.lampmetall firing circuit breaker terminal earth leajagr

Sans10142-1:2017.

Multicore PVC insulated armoire cable sans 1507 voltage drop bbperamper meter aluminium conductor.

Conductor operating temperature 70.

Conductor cross sectional area.two core d.c.two core cable.

MV/a/MB .4,5..r,x,z...////three core or four core cable phase a.c MV/A/m. r,x,z 3.9. ..

In the case of single circuit the return path has been account for the given.

..

Correction factor for soil temperature maximum conduct temperature 70 Celcius.

Soul tempera.correction cable buried directly in pipes in the ground....

Therminal resistivity soil km/w..cable buried directly in ground..cable installed in pipes buried in ground ..the correct factor have been average over range size consult ..cable..Carycurent neutral correspond reduced load phase ..

Unbalance circuit..harmony.. impedance of 6000/1000

Department of higher education and training
Republic of South Africa
National certificate examination
Mathematics n6./ Level 6/ .nqf 6. ...
Time 3hours.
Marks:100
Instruction and the questions.

2.read all the questions carefully.number according used.

Questions.1.

1.1 given $z = 1/\cos.\cos.\cos (5x+2y)$

Determine minimum..

Partial $z/\text{partial } /x$ gradient . Variation differential.

1.2 given $x = 1 + 2t$ and $y = 3/1 + 2t..$

Determine

1.2.1. $Dy/DX.$

1.2.2 $d.dy/d.x \ x$

Questions 2

Determine integral ydx if

2.1 $y = e \exp - 3x \cos 3.x$

2.2 $y = -e^{-6x}$

2.3. $y = \tan.\tan.\tan.\tan.4x..$

2.5 $y = \ln(1/x)$

Questions 3.

Use partial fraction to calculate the following integrals.

3.1 integral. $x^3 + 2x^2 - 4x - 11 / (x+3)(x-1) \cdot dx$

3.2 integr $6x^2 - 4x + 10 / x(x^2 + 2) \cdot dx$.

Questions 4.

4.1 determine the particular solutions of $x \frac{dy}{dx} - 2y = x^2 \cos x$ at (2;1)

4.2 determine the general solutions of $\frac{dy}{dx} - 2y = e^{2x}$

Questions 5

5.15.1.1 determine the points of intersection of the graphs of $y = 2x$ and $2 - 1/2x$.

Sketch the graph and show the area bounded by the graph of and the axis

Show the representative strip / rment you will use to calculate the area.

5.1.3 calculate the area described in question .

5.1.4 calculate the area moment about the y axis as well the disty from y axis of then centroid of the area in .

5.3 sketch the graphy of $x^2 + y^2 = 49$.

Show the area in the first quadrant bounded by the graph ,the line $y=2$, $y=5$ and the y axis show the representative strip you will use to calculate the volume when the area is rotated about the y - axis.

5.2.3 calculate the volume generated when the area described in question .5.2.1 rotated about the y - axis.

5.2.3 calculate the distance from x axis of the centref gravity of the solid.of obtain when the area in question.rotate about the y - axis

5.3 5.3.2 sketch the of $y = \cos x$ and for $0 < x < \pi/2$

Show the area bounded by the graphs and y- axis.show the representative strip you will to calculater the area.

5.3.2 calculate the area described in question

5.3.3 calculate the second moment of area about y -axis pfarea description.

5.4.1 the cross section of water tank is the form of trapezium the bottom the tank in .4m wide the top is 4 m wide and the height of the tank is 4 the.tank is full of water sketch the cross secty the tank and show the representative strip you use to calculate the area moment.veryi Al ed the tank.

Calculate the relation between the variable x and y

5.4.2 calculate the area moment of a vertical end of tank about the water level

5.4.3 calculate the depth of centre of pressure on the vertical end of the tank if the second moment of area is given as 69,333 M³

Questions 6

6.1 calculate the length of the curvr

$$y = x^3/4 + 1/3x \text{ from } x=0 \text{ to } x=4$$

6.2 calculate the surface area generated when the curve $c=y-9$ for $y < 9$ is rotated about the x axis

Total 100

Department of higher education and training republic of South
Africa
National certificate
Control systems n6
Time 3hours
Mark 100

1. answer all the questions.
2. read all the questions carefully
3. number the answers according to the numbering system used in this paper
4. insert completed three semilogarithmic graph paper of body plot into the answers book before handing
5. write neatly and legibly

Questions 1.

Explanation control action is independent on the output

1.2 slow variation of the output voltage or current of the amplifier when the input signal is mainly at a constant level

1.3 response tends to overshoot the goal with oscillation decaying very slowly or not at all.

1.4 time take response to complete one full cycle.

15.

Condition brought about when two complementary energy strong components of a dusty procedure a oscillator between them

16.frequency produced when two comp energy -storing component of systems produced an oscillator between them.

1.7 sum of the transient response and the steady state response of a linear constant different equation

1.8 system where the output has an effect on Ty input to.maintain the outputs at a desired value.

1.9 mathematics equation containing elements of a system system to be transferred from the input to the output assuming all initial conditions to be zero.

1.10..shortland pictorial representation of the cause and effect relationship between the input and output of a system..

A ..

Time period

B. Closed-loop system

C.undamped natural frequency

D.feedback

E.total response

F.transfer function

G.underfamping

H drft

I block diagram

K resonance

K..

Questions dream block dit algebraic reductions,the control ratio of the bloc diagram

Questions 3.

The transfer function of an open loop control system is given as

$$G(s)H(s)=75/s.s+15s$$

..

3.1completed it by calculating the log magnitude and phase value for each the missing frequency

W(rad/s)

GaunA(db)

3.3 dream the bode plot for system on a three -cyckesemloharithmicgrap
Diagrams illustrate a closed loop gain versus phase plot on a Nichols chart

4.1 use the Nichols charter to determine each of the following.

4.1.1 the gain margin

4.1.2 the phase margin

4.1.3 the phase margin .

4.14 the phase crossover frequency

4.15the undamped natural resonance frequency

4.1.6 the peak frequency response

4.1.7 the peak magnitude and phase

4.1.8 the closed-loop phase

4.2 state whether the system is stable or unstable

Questions 5.

Diagrams illustrate a root locus plot of an open-loop system as the amplifier gain varies from zero to infinity.

Use the root locus plot to determine each following

5.1 the damping factor (ζ) at point D

5.2 the undamped resonant frequency (ω_n) at point d

5.3 the damped resonant frequency (ω_d).

5.4 the gain constant K_o at point D

5.5 the open loop poles

5.6 the frequency at which the system becomes unstable..

Questions 6.

6.1 convert given Laplace transform function to a function of S ..

$F(t) = e^{-at}$

6.2 convert the given Laplace transform function to a function of t

$F(s) = \frac{21}{s(s+3)(s+4)}$

6.3 the input voltage to a differentiator amplifier has an input voltage of 9V with a resistance of 10k and capacitance of 5μF

6.3 draw a neat diagram of circuit

Calculate the output voltage of the circuit

Questions 7.

7.1 what is a triac.

7.2..

Questions 8

8.1 draw a neat labelled schematic diagram of a half-wave rectified control circuit for a separately excited motor.

8.2 give two disadvantages of using electrical power in electrical controller.

..

Questions.

9.1 List rotary pumps

9.2 Name type non-positive displacement pump

9.3 give six advantages of using fluid power

Questions 10.

10.1 which type of filter is a CR differential circuit

10.2 explain the term impedance matching of test equipment in oscilloscope.

10.3 calculate the value of the unknown frequency (f_h) for the figures below.

Hint: $f_h/f_v = \dots$

$f_v = 500\text{Hz}$.

wrote:

Power machine

Questions 1.

1.1 name one type of governor

1.2 completed the following sentence by writing only the missing word next to the question number (1.2)

1.3 name two main components of a steam generator plant.

1.4 various option give answer the following.

1.4.1 partial pressure of steam can be read from the steam table if the of condenser is know

1.4.2 equiangular blades mean that blade inlet and outlet angles are.
A 90.
B.the same
C.different.

1.4.3 potties of gases a step .

Questions 2
Balloons,

Quest 4 used steam ..

Questions 4.

Question 5

Questions 6
A jet a supplied. ..

Department high education and training
Republic of South Africa
National certificate
. examination electrotechnic
. Time.

Marking guidelines consist 12page/ tes

Chief marker
Internal moderator
MC

Concession

Reduce marks for questions 7.2 by 6 marks
Mark all candy out of total 94 marks
Convert the mark achieve out 94mark
Record the percentage achieve on the market sheet

Total 10
Questions 1 DC machines explain

1.

Questions 2 AC circuit theory
Explain three phase circuit..

Questions 3. Transformer
3.1explain

Questions 4. AC machine alternator..

Questions5.. AC machine synchronous motor.

Questions AC machine induction motors

Questions 7.generation and distribution of AC

Examination internal.. external

TSHINGOMBEKB TSHITADI
<tshingombekb@gmail.com>

Sat, Aug 27,
2022 at 5:52
PM

To: TSHINGOMBEKB TSHITADI tshingombekb@gmail.com

High education department

Training, st peace college

Certificate

Power machine

Time 3 hours

Questions 1.

A convergent nozzles receive superheated steam with a specific heat capacity of 2,76/kg, a pressure of kpa a temperature of 276 degree .the steam is expanding to a pressure of 600kpa with a isentropic dryness factor of 0,945 which is 99,265% of the actual dryness factor. At the throat the pressure is 1400 kpa, the temperature is 205 degree Celsius, the index (n for the superheated steam is 1,3 and the velocity is 500 m/ s.the velocity at the inlet is negligible.

1.1 the specific enthalpy of the steam at the inlet of the nozzle.

1.2 the specific enthalpy, the specific heat capacity and the specific volume of steam at the throat of the nozzles.

1.3 the isentropic specific enthalpy ,the actual dryness factor, the actual specific enthalpy and the specific volume of the steam at the exit of the nozzle as well as the efficiency of the divergent part of the nozzle .

Questions 2 the blade of two stage, velocity compounded impulse gas turbines has an average diameter of 976 mm and rotates at 3131 r/Min.

The velocity of flow at inlet to the first stage is 225 m/s

.the velocity of flow at inlet to the second stage is 100 m/s.

.the outlet angle of the first row of moving blade is 25 degree

The outlet angle of the second row of moving blade is 28 degree.

.the gas leaves the turbine at an angle of 80 degree there is a 4% loss of velocity. Across all the blades due to friction.

2.1 construction velocity diagram for the turbine in the answers book by using a scale of $1\text{mm}=5\text{m/s}$. Indicate the length of all the lines as well as the magnitude of the angle on the diagram.

2.2 determine the following the velocity diagrams.

2.2.1 the nozzle angle

2.2.2 the inlet angle to the fixed blades

2.2.3. the outlet angle from the fixed blades.

2.2.4 the inlet angle to the second row of moving blades.

2.2.5 the inlet angle to the first row of moving blades.

2.2.6 the nozzle velocity in m/s

2.2.7 the velocity of the gas leaves the first stage m/s.

2.2.8 the velocity of the gas leaving the fixed blades in m/s.

2.2.9 the velocity of gas leaving the in m/s

2.2.10. The relative velocity of the gas at inlet first stage in m / s.

2.2.11 the blading efficiency.

Questions 3.

An open circuit, continuous combustion, constant pressure gas turbines received air dry the atmosphere at 15°C and compression it to five times the intake pressure in a rotary compressors air then passes through a heat exchanger in which $1018,574$ if heating is added constant pressure per second from the combustion chamber the air expands through a gas turbines to

atmospheric pressure and at this pressure pass through the heat exchanger to the exhaust where the temperature is 231,6 degree Celsius.

The isentropic efficiency of the turbine is 82%,.

The air flow through the plant at a rate of 2,5 kg/s. Neglected the mass of the fuel and take γ as 1,4 and CP as 1,006 KJ/ kg.k

3.1 the absolutely isentropic and the absolute actual temperature after compression.

3.2 the absolute temperature before expansion, the absolute isentropic and the absolute actual temperature after expansion.

3.3 the power developed by the plant in kW and the thermal efficiency.

3.4 the efficiency of the heat exchanger.

Questions 4.

At three stages -, single -acting, reciprocal compressor delivery 900kg of air per hours to an aftercooler at pressure of 4116pa.

The pressure in the first intercooler 336kpa..

The cylinder volume of the intermediate cylinder is 26 time it's clearance volume.

The temperature at the entrance to the low pressure cylinder is 27 degree Celsius

The rotation frequency of the compressor is 290 r/Min.

Intercooling is completed and the stage pressure are in geometrical progressive take R for air as 0,288kj/kg.k

Calculate the following

4.1 the pressure in the second intercooler in kpa , the pressure ratio and the pressure at inlet to the low pressure cylinder.

The.

4.4 the effective sweep volume in m cube / cycle volumetric efficiency, the swept volume, the clearance volume and the cylinder volume in m cube cycle for the intermediate cylinder.

Questions 5.

An engine operating on ideal constant volume cycle uses air as the working fluid the initial pressure and temperature are 105kpa and 77 degree Celsius respectively. the

The volumetric compression ratio is 7,179:1

The network transfer during the cycle is 551,424kj/kg of air.

Take gamma for air as 1,4 and CV as 0,718kj/kg of air take gamma for air as 1,4 and CV as 0,718kj/kg.k

Calculate the following

5.1 the missing pressure in kpa and missing absolute temperature at the principal point of the cycle.

5.2 the heat received in KJ/kg of air, the heat rejected in KJ/kg of air and the air standard efficiency..

Questions 6.

The boiler plant consists of economiser absorbs 8,256% of the heat supplies the fuel, an evaporator and a superheater. the superheater absorbed 2586,02kj heat per kg of fuel burner

The overall thermal efficiency of the plant is 82,56%>

The plant produces 8170kg of steam per hour at a pressure of 2550 KP and a steam temperature of 301 degree from 950 kg of fuel

burner per hour.

The calorific value of the fuel is 30 MJ/ kg.

The specific heat capacity of the superheated steam is 2,75 KJ/kg.k

The moisture in the flue gases carried 1575 KJ of heat per kg of fuel away through chimney

The heat carried away by using steam table only..

6.1. 6.1.1 the specific enthalpy of steam procedure.

6.1.2 the specific enthalpy of the feed water entering the economiser

6.1.3 the specific enthalpy of the feed water entering the evaporator

6.2.1 the dryness factor of the steam entering the superheated

6.2.2 the heater absorbed by the evaporator in KJ/kg of fuel

6.3 draw up a heat balance in KJ /kg and a percentage for each component the plant and the heat losses by the flue gases, to determine the percentage heat loss unaccounted for.

Questions 7.

A vapour compression refrigerator plant uses 0,5 kg of carbon dioxide per second a refrigerator the plant operated between pressure limits of 3128 kpa and 6748 kpa the refrigerant is dry saturated vapour at the compressor inlet and at the inlet to the condenser it has a temperature of 65degree Celcius

The specific heat capacity of the superheated refrigerant is 2,18kj/kg k

The Saturated liquid refrigerant leave the condenser at temperature of 22 degree

The specific heat capacity of the liquid refrigerant is 4,12 KJ/kg.

The specific volume of the saturated refrigerator at compressor inlet is 0,012 meter cube per kilogram

The stroke length of the compressor is 1,2 times the piston diameter.

The volumetric efficiency of the compressor is 92,1%. And it's rotational frequency 240 r/Min

The following are extracts from carbon dioxide table

Saturation temperature celci degree/ pressure// specific enthalpy (KJ/kg)

-4// 3128 kpa//liquid (hf) 74,3. 172,3// vapour 320 //269.

Calculate the following.

7.1 the specific enthalpy of the refrigerant after isentropic compression and the power requirements in kW to drive the compressor.

7.2 the mass of refrigerator in kg /cycle, the volume of the refrigerant in m cube per cycle the swept volume of the compressor in m cube cycle the diameter of the piston in mmm and the length of the stroke in mm

7.3 the specific enthalpy of the refrigerant at the condenser outlet, the refrigerant effect in KJ / s and the actual coefficient of performance.

Total 100

Scaling

Higher education training

Department: high education and republic of South Africa

National certificate mathematics n6.

Time 3h00:

Questions 1.

1.1 given: $z = \ln(\sqrt{x} + \sqrt{y})$

Prove that. Derived partial $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = \frac{1}{\sqrt{x} + \sqrt{y}}$

1.2 the radius (r) of a right circular cylinder increase from 4 cm to 4,1 cm and it height (h) increases from 20 cm to 20,5cm

$$V = \pi r^2 h$$

Questions 2

Determine $\frac{dy}{dx}$ if :

2.1 $y = \frac{1}{(x+3)^8}$

2.2 $y = \ln 2x \ln x$

2.3 $y = \frac{1}{1 + \tan x \tan x}$

2.4 $y = \sin^3 x + \cos^3 x$

2.5 $y = 3 \tan^{-1} x/3$.

Questions 3.

Use partial fraction to calculate the following integrals:

3.1 $\int \frac{x^2 + 5x - 6}{x(x+1)(x-1)} dx$

3.2 $\int \frac{2x^3 + 6x^2 - 12x + 12}{x(x+3)(x^2+3x+4)} dx$

Questions 4.

4.1 determine the particular solutions of

$$DX/dy - 3y = 2x. \text{ At } (1;0)$$

4.2 determine the particular solutions of

$$dy/dx - 6y/DX + 9y = 18 \exp^{-3x}. \text{ When } y=1; x=0 \text{ and } Dy/DX = 2; x=0.$$

Questions 5.

5.1. 5.1.1. Sketch the graph of $y = 2 \ln x$ and $y = 2x$. show the area bounded by the graph, the x-axis and the line $y = 2$. show the representative strip that you will use to calculate the area.

5.1.2 calculate the area described in question

5.1.3 calculate the area moment about the y -axis as well as the x co ordinator the centroid of the are described.

5.2...5.2.1. Sketch the graph of $y = \tan x$ for $0 < x < \pi/2$. the area enclosed by the graph, the x axis and the line $x = \pi/4$ rotates about the x-axis. show the area and the representative strip that you will use to calculate the volume.

5.2.3 calculate the moment of inertia about the z-axis of solid obtained when the area in questions 5..

5.3 5.3.1. Sketch the graph of $y = e$

$\exp(-x^2)$

Show the area bounded by the graph, the x axis, the y axis and the line $x = 2$ show the representative strip that you will use to calculate area and the second moment of area.

5.3.2 calculate the area described

5.3.3 calculate the second moment of area about the y axis of the area described in questions 5

5.4. 5.4.1 a triangle plate of side 5m, 5m and 6 m is placed vertically in a canal which is 5 m deep. the longest side of the plate is horizontal and is 1m below the water level.

Sketch the relation between the variable x and y.

5.4.2 calculate the second moment of area the plate about the water level as well the depth of centre of pressure on the plates if the area moment is given as numerically equal to 28 m cube..

Questions 6.

6.1 determine the length of the curve

$y=9-x$ from $x=0$ to $x=3$

6.2 calculate the surface area heated when the curve $x=y.y.y$ for $0 \leq y \leq$ is rotated about the y -axis..

Total: 100

High education and training, st peace college

Republic of South Africa

National certificate

Engineering physics n6., NQF

Time:3hours

Marks:100

Instruction and informaton

- 1.answer all the questions.
- 2.read all the questions carefully.
- 3.number the answers according to numbering system used in this question paper.
- 4.keep subsection of questions together.
- 5.all calculate should consist of least the three steps:
 - 5.1 the formula used or the manipulation therefore
 - 5.2 substitution of the given date in the formula.
 - 5.3 the answer with the correct si unit
- 6.the constant value,as they appear on the attachment informaton sheet, must be used were ever possible.
- .7 use $g=9,8\text{m/s square}$.
- 8 drawing instrument must be used for all drawing / diagram.drawing diagram must be fully labelled.
- 9.. answer must be rounded off to three decimal place.
- 10.rule off completion of each question.
- 11.writw neatly and legible.

. Questions 1. Sound

1.1 explain with you understand with the following concept as applicable to standing wave node and antinodes.

1.2 determine the longest and shortest length of a church organ pipes which are open at both ends, of which the frequency is between 68 to 2095 Hz.

The speed of sound in air is 345 m/s

Determine the following

1.5.1 the frequency heard by the pedestrian standing at the crossing while the car is approaching him /her at a speed of 55 km/h.

1.5.2 the frequency heard by the pedestrian if he/she runs after the car

1.5.3 the frequency heard by the pedestrian if he/she runs towards the car at a speed of 6 m/s

1.6 A test was conducted in a laboratory on a Kundt dust tube an aluminium rod with a length of 0,7 m and which was clamped at its mid-point is set in longitudinal oscillation the distance between the dust heaps in the tube is 85 mm.

Determine the following if the speed of sound in air is 345 m/s

1.6.1 the velocity of sound in the rod.

1.6.2 the frequency of the note emitted by the rod.

1.7 A captain standing on an anchored boat observed that the boat has risen and fall through a total range of 2,5 metres once every 4 seconds as waves with crests that are 32 metres apart

pass.determine the following:

1.7. 1 the frequency of the waves.

1.7.1 the velocity of the waves

1.7.3the amplitude of the waves

1.8 piano player attached the piano strings to one end of a turning fork and it is vibrating with a frequency of 260 Hz the length of string is 80cm and it's mass is 120 grams

Determine the following

1.8.1 the wavelength savewa yranoitats egth

1.8.2..the the velocity v of the stationary wave s

1.8.3 the tension applied to the string that will cause it to vibrate in 4segments

QUESTIONS 2; thermodynamics and steam

2.1 explain the difference between an isothermal change and an adiabatic change of a gas.

2.2 define the second law of thermodynamics.

2.3 Kevin power station develops 600mw of power with 35percentage efficiency.the exhaust heath is exposed into a river with an average outlet flow of 35kg/s used the specific capacity of water =.

2.4 wath is the relation between the efficiency of a Carnot cycle and the maximum and minimum temperature of the process .

2.5 Carnot wath is meant by the triple point of substance.

2.7 one and half kilograms of gas with an initial temperature of 23 Celcius degree and a pressure of 180kpa is compressed adiabatically to a pressure of 1200 kpa.uae CP as 861 j/kg Celcius

CV as 615 J/kg Celcius

Calculate the work done during the compression

2.8 during an experiment the following data was use.ice cube with a temperature of -8celcuis and a total mass of 55 grams are placed in a 330 gram cup of tea 82 Celcius use the heat capacity of tea as the same as water and determine the final equilibrium temperature of substance..Use the following data in the calculation.the specific latent heat of fusion of ice is equal to 333 KJ/kg and the specific heat capacity of ice is equal to 2,089 KJ/kg.k

Questions 3: electrostatics

3.1 calculate the electric field strength in air midway between two point charges of $+20 \times 10^{-8}$ C and -5×10^{-8} C separate by a distance of 19 cm.

Hint : using k as 9×10^9 NM square / coulomb

3.2 A parallel -plate capacitor is made with seven metal plates and separated by sheet of Nica having a thickness of 0,3mm and relative permeability of 6. The area one side of each plate is 500 cm^2 .

Calculate the capacitance in microfarad.using the permittivity of free space as $8,85 \times 10^{-12}$

3.3 determine the energy stored in the capacitor when a 1,2 if television set capacitor is subjected to a 3000 V potential difference across its terminal.

3.4 A gate motor battery of 12V is charge at rate 15 coulomb per second

Calculate the following:

3.4.1 the amount of power need to charge the battery.

3.4.2 the amount of energy that is stored in the battery if it is charged for one hour..

Questions 4: Atom physics (charge + e)!an electron (charge - e) that are $5,3 \times 10^{-11}$ m part.. calculate the attraction force between them..

4.2 the photoelectric effect litgh directed at the surface of certain metal cause electron to be emitted. In the case of potassium, 2eV of work must be done to remove an electron from the surface.

Calculate the following:

4.2.1 if light of wavelength 5×10^{-7} m falls on a potassium surface, calculate the maximum energy of the photoelectrons that emerged.

4.2.2 if light of wavelength 4×10^{-7} m falls on the same surface, calculate whether the photoelectrons will have more less energy. Use $\therefore 1\text{ev as } 1,6 \times 10^{-19}$ joule

Take : $e = 1,6 \times 10^{-19}$ c and Planck 's constant $= 6,63 \times 10^{-34}$ j.s

4.3 calculate the kinetics energy in ev of electron with a velocity of 10×10^7 m/s take the mass of mass of an electron equal to $9,1 \times 10^{-31}$ kg

4.4 why should the neutron be an effective projective for penetration the nucleus of an atom.

4.5 completed the following sentence by filling in the missing word writing on the world.

Next to question ,4.5.1 4.55

4.5.1 gamma rays are electromagnetic wave of exactly the same type ASX - rays,and differ from x rays only in

4.5.2 by magnetic deflection the beta particles were shown to be..

4.5.3 alpha particles have charge of $+2$ electron unit and mass of.

4.5.4 in 1899 Rutherford found that a type of radiation was stopped or absorbed by a thin aluminium sheet of 0.002 cm this radiation he called..

4.5.5 Rutherford also found that another particle required a few millimetres of aluminium to be stopped or absorbed. this radiation he called.

4.6 when a metal is heated, electrons are ejected.

4.6.1 with name is given to this phenomenon.

4.6.2 briefly explain why electrons are ejected.

4.6.3 explain why ejected electrons would return to hot metal..

4.7 what is the relationship between the energy of photons and its frequency.

4.8 what is meant by threshold frequency when referring to the photo electric effect

Total : 100

Scaling total .

Defense total

Presentation foundation

Formula

High education and training

Departments

Republic of South Africa

National certificate

Industrial electronics n6

Time:3hours

MARKS:100

Instruction and informaton

1.answer all the questions.

2.read all the questions carefully.

3.number the answers according to the number system used in question papper

4.write neatly and legibly.

Questions 1: transients

1.1 the following components are assembled for an experiment on current decay in an R-l-c

A variable resistance of unknown value

A capacitor of 22,75uf

An inductor of 32,25 my

If critical damping is employed for this experiment, calculate the value of the nature frequency (fn) of oscillocation of the wave train that would be produced on the display of the test instrument used for this

1.2 name the two damping methods that could also be used to conduct the experimental in the question.1.1

Questions 2: transducer

2.1 give the standard current range value that must be used for signal conditioning.

2.2 in a face brick manufacture factory the temperature of a thermally insulated chamber ranges from 155 degree Celsius to 555 degree celsius.a thermocouple Wich measure 1,55 MV per 10 degree Celsius on the output of an op-Amp multiplier circuit is used to interface with a standard signal rang of 1 v to 5 v for a metering resistor value 1,55k ohm calculate the value the suitable feedback resistor that is connected to the op-Amp..

Questions:3 ultrasonic,x ray and radio activity.

3.1 ultrasonic energy is generated through wave that have short wavelength.

State two characteristics features of ultrasonic energy as resultat of the short wavelength.

3.2 when employing ultrasonic machine processes to machine hard and brittle material,it is the cutting fluid and the cutting tools that doesn't the actual cutting.

3.2.1 give another name for the cutting fluid that is used for ultrasonic machining process.

3.2.2 state four function of the cutting fluid used during the ultrasonic machine processes.

3.3 state the main advantage for not generating external heat when employing ultrasonic welding techniques.

3.4 A photomultiplier tube has a cathode sensitivity of 45uA per lumen and consist of state each with an emission factors of 7..if the maximum safe .

Calculate the following:

3.4.1. The amplication

3.4.2 the tube sensitivity

3.4.3 the maximum safe illumination

3.5 name three factors that determine the sensitivity of photomultiplier

Questions 4: Automatic inspection, testing and NDT

4.1 inspection of articles form an integral part in any manufacture process.

4.1.1 give one main reason for the need to carry out the inspection process on manufactured articles..

4.1.2 name the two group into which inspection, testing, sorting and Harding device are divided..

4.1.3. Distinguish, in terms of yielded results , between the two inspection system in question 4.12

4.2 non destructive testing is a method used for testing items for defects which are not visible to the human eye.this can be achieved through the use of x-ray tubes.

Name the three methods commonly use for non -destructive testing through the use ofx ray tubes.

Questions 5: electronics safety device and electronic power control.

5.1 industry,safe operation of machine is dependent upon acute designing and connection of electronic safety device to the industry machine

Distinguish with respect to connections technique.three main difference between positive protection and negative protection...

5.2 briefly define the term intrinsic safety,as applicable to the workplace safety environment

5.3 closed -loop control system are divided into two main groups..name and described the two groups into two which close loop system are divided..

5.4 the development of a CAD system can be broken down into a number of development stage..draw a labelled block diagram to show these stages..

Questions 6: thyristor device and scr speed control.

6.1 A simple thyristor half wave rectifier circuit which uses an act and a resistive load, operates on the following data:

.Vsupply=240 Varma

.Rl=unknown value

. thyristor (scr) current=15A

Calculate the following:

6.1.1 the mean load voltage for 0degre Celcius and night degre90.

6.1.2 the maximum thyristor voltage

6.1.3 the RMS value of the current flowing through the thyristor..

6.2 state six advages of direct current motor speed control.

Questions 7: programmable logic controllers..

7.1 A typical PLC consists of three basic section,namely,a programmer.programmable controller and explain expansion unit

Dream a complete fully labels block diagram of a programmable controller unit of a PLC .

7.2define the following term Asin the study of PLC s

7.2.1 edit.

7.2.2. Elements

7.2.3.rung

7.2.4 timer

7.3 dream albelled ladder diagram of Anand function using two input contacts..

Total 100

Scale Rating

Defense factory..

Department of higher education and, st peace college
training Republic of South Africa national certificate.
Electrotech n6.

Time :3hours

Mark:100

Instruction and informaton

- 1.answer all the questions
- 2.read all the questions carefully
- 3.number the answers according to the number system used it this questions5
- 4.round off all calculation to three decimal place
- 5.use the correct symbol
- 6.start each question on new page.
- 7.keep subsection of questions together.
- 8.all circuit diagram and vector diagram must be least on third of page and must be fully labelled.

Questions 1.

1.1 dream and explain the operation of a ward -leonard control system, controlling the speed and direction of a large DC shunt motor.

1.2 A 250v,DC series motor runs 1000r/Min while drwawing a current of 40 ampere from the supply the resistance of the armature and series field are 0,25ohm the supply.the resistance of the armature and series field are 0,25 ohm and 0,1 ohms respectively.

1.3 draw two fully labelled circuit diagram used to solve

Questions 1.2 clearly the current flow in both diagrams.

Questions 2

An alternating voltage represented by the expression, $v = 30\sin(314t + 25) + 10\sin(942t - 30)$ is applied to a resistor of 180 ohm in parallel with a capacity 25 micro farads.

2.1 an expression for the instantaneous value of current.

2.2 the power factor of the circuit (state the nature of the power factor)

2.3 the energy dissipation in the circuit in 10 Milli second

2.4 draw a large vector diagram clearly showing the voltage and current for the fundamental as well as the harmonic components.

Questions 3.

3.1 state two constant losses occurrence in a transformer and state precisely where each occurs

3.2 A 250 KVA, 3300/240 v single phase transformer produces a maximum efficiency of 92% at 80% of full load

Calculate for a power factor 0,85 lagging:

3.2.1 the iron losses

3.2.2 the full -load copper losses

3.2.3 the percentage resistance

3.2.4 the per unit full load voltage regulation of the transformer when it works at unity power factor

Questions 4

4.1 what do you understand by the distribution factor of a synchronous alternators.

4.2 the following information applies to a three -phase,star - connected altnator:

Open circuit terminal EMF=3,3kv

Frequency=50hz

Speed=1000r/Min

Number of slots/pole/phase=4

Coil span=150

Useful flux per pole =55 mill Weber's

Calculate the possi number of conduct per slot

Questions 5.

A 380v, 50hz, three-phase, stat-connected synchronous motor has an induced EMF of 500 volts.the synchronous impedance of . The motor is $(1,5+j4,8)$ ohm per phase. For a load angle of 25 degree electrical calculate.

5.1 the current drawn by the motor

5.2 the power output of the motor ifs efficiency 85%

.5.3 dream a full labelled vector diagram that you would use to solve this example.

Questions 6.

A 525v, 6 pole,50hz three phase delta connection induction motors developed 28kw when running at speed of 950r/Min .the rotor iron loads is negligible and the frictional loss in the bearing is 800watts.for a power factor of 0,8 lagging, calculate.

6.1 the percentage slip at which the Motor is operating.

6.2 the rotor copper losses

6.3 the power input to the motor if the total losses occurrence in the stator amounts to 1080 watts.

6.4 the current drawn from the supply

6.5 the efficiency of the motor

Questions 7

A large industrial consumer takes 1 MVA at a power [factor to](#) reduce maximum demand, a capacitor bank was installed and the overall power factor was improved to 0,9 lagging.

Determine

7.1 the sizes of the capacitor bank

7.2 the cost of the capacitor bank if it sells for R295 per kVA

7.3 how many months it will take to pay off the capacitor bank using only the savings in maximum demand charge? Assume that the consumer pays a maximum demand charge of R132 per kVA..

7.4 draw a neat fully labelled vector diagram clearly showing the maximum demand before and the installation of the capacitor bank.

Total 100

.

Criteria outcome Min max

Achieve.

Defense factor explain.

Test orthographic projection

Assessment police tools control circuit

Test framework regulatory mandate low.skill admnise
communication test communication strees .manage system
information test info recruitment system activity over stocks test
simulation control circuit phase crime analyse source data ..humain
induction management system planning test orientation careers..
theory crime incidence evidence test ..crime investigation principle
evidence trial test

Paralegal Deb financial test, delivery test assessment activities .file
system indicator system ph draug analyse adn..finger print digital
relation identify test examin correlation test relation map felonies
detection....fire arm study material, health pathology forensics test
test examin size mass. Centrifugal microscope blood test.body
scamming system file .it dabase..

Test performance police training test Poe evidence values..

Check.procedure check calibration operationa explanation material

conduct insulation magnetic Armie conductor low.

AC.rc current installation check panels check. Calibration
operational current formula low.

Resistivity conductive aupra conductivity impedance.z. $1/z, 1/r$
resonance test instrument class value correct instrument model AC
DC characteristics operational efficiency correct../

Entry assessment credit module completion.. value engineering

Outcome exhibition assessment process control technologies.

Instrument method measure screening outcome
compulsory.component engineering electrical subject meet award
original meet certificate registered extra circulum .

Operational task module entry criteria ward . transcript..
operational,

..

1. Tools assessment .mark Check

Measure installation.

voltage voltmeter.amperemeter,watermetet,voltmeter etalon kWh
cosmeter care meter ohmeter...calibration check material checking
conductivity, insulator.magnetics., resistance check field magnetic
flux meter light ..cell densimeyer checking..

Power factor maximum demand check .

2. Tools assessment. Mark check system fundamental
assignment.

trade theory electrical switches control test way control insulation
average installation way minimum maximum value RMS value
nominal maximum circuit breaker way .Relay delay timer fuse
maximum value rating trading db box maximum value..inom.imax
switch circuit way .bulb lighting trade minimum cost value .

metering cost value.. installation specifications material trade
power supply.minim.balance equilibrium circuit, ligne
transformation value trade motor load AC DC current value
current.line 1,2,3. Compliance safety security trade required
operational miniu time operational network.prevention health first
aid, components

3.tools assessment. ,

test operational AC ,DC, motor AC,DC, generated, method,,
verification transformation test insulation auto transformation test.
Measure transformation measurements power factorise,
transformation start Delta test measure, Relay current ,rating .AC
DC motor test insulation characteristics power torque relever
machine ban control test . Hopkinson breaker rating,. Methods
earth.machinery current test trade month cooling test breaking
value measure instrument loading test average value RMS .

4.tools assessment check

test operational transmission overall.overload system transmission
generation plant power test ,insulation test safety security

Inspection circuit breaker circuit gear .. inspection transmission
insulator support network test arena radial test cabling distance
effect network.

Control dispatch distribution system distribution load,

Fundamental system control . Low

Line current phase curent

5.tools assessment module criteria

Test semie conductor .diode rectifier full halph light photos food
test value current peak.test evaluation characteristics
specific.soldering resistor capacitor active passive elements
manufacture test criteria..test transistor phototransistor circuit
transistor value load efficiency.tyristor disc triac silicon integration
circuit operational transistor test multimeter amperage voltage
bias relever.. Kirchoff low,step . detection transducer motor DC AC
magnetic measure . oscilloscope digital PC test value alternative..

regulatory test ..logic diagram register process electronic key lock timer summer test ,.

6.tools assessment circular

Engineering science static analyse specific load experimental control kinematic level doped velocity distance initial..test odometer calibration bank test panel car..power test material strength. Momentum test level turning test dynamometric key ..

Fulcrum pulled test pandil .test rather . electricity low test electro test..heater colorimetric test specific test break energy kinetic friction . Min max load

Test hydraulic ..pressosta thermometer. Conductivity heater test

.. Engineering physic. Test gyroscope. Test top. Test. Force attractive repulsive test diffusion

Power machine test steam machine compressor heater test .tr/Min

7. Mathematics tools assessment gradient.. algebraic geometry statistics equation, test angular . trigonometric test

8.Engineering drawings .

Orthographic projection construction cut view, assembly,

Test ligne dream project rerojection tools rules synoptic test scenarios tools..

Control assessment panel didactic tools. Orthopedagogic planning lecon project board,

On Sat, 20 Aug 2022, 17:23 TSHINGOMBEBKB TSHITADI,
<tshingombekb@gmail.com> wrote:

1..register saqa admin .national framework regulatory
qualifications . instituts foreigners

Credit subject entry .nqf1.12..

Award diplomat work day certificate.1th,.[2.th](#).,3th,,4th level

I'd number submitted.. record

Academic transcript learner student lecturer..

N national certificate diplomat.

Credit equivalent entry evidence explain

50%..50/100..equivalent. award minimum. meeting

Name surname credit acredit minimum

I'd/name/years qualifications//provision//.

1.register national examination ,

N diplomat. Examination n 1.n6 diplomat t1.

I'd /name /years///file student/submitted document file///

Courses attendance////exam attended

I'd number registered.regulier diploma n

18month.attendance.term 1.term2.term.3week

Level1.2.3 minimum engineering electrical learning national trade

Registered.. regulier/

I'd number candidate.//.I'd regulier.//

I'd name///class level///file number//submitted number ///documents attached

National

N1.n3..rwiten final engineering

N1,N2, council test trade .

Councils education..

I'd number candidate irregularity register

Reg .I'd number submitted.

Rectorat college director principal

System

College internal registered. St peace

And institutor ..distance university

.grade..1..12... level 1.2.63.4.5.6

Under graduat .1.2.3.4

Learner

Teacher

Lecture

Professional

Subject faculty admnise

Regularity .. irregularity ruling

I'd name . Term 1.2.3.4.5.6.7.8.9.semester1,2

Report internal diploma.certificate award . internal statement
internal report . homework classwork test .exam internal syllabus
hand book campus module practice.

Assessment assignment homework practice theory skill give to
student to prove if student at home classes on completion is
capable to resolve trade theory Test is capable to working by self
group peer

Module correct diagnostic

Manufacture maintenance testify attest award brevet certificate is
true

Recording examination.diplomatic to council of test function
working yes and to evaluate grade level n it test coming rather
working nice.

T

Test circuit.nice erroneous value home.

Test operational

Commission.

1.homework class work exercise books topics research on line Poe
exercise book.//capacity to make reproduct analyse
rwiten.///criteria minimum requirements 100

2.test evaluation module topics test research Poe's /functional
school academic task system function.///

3.examination evaluation diagnostic module external internal /low

competency year term weekend rating period achieve rerwite.

Remark.////

Skill engineering

Criteria meet award low saqa questions5 interpretation

Operational control

Good

..

Designing... workplace workshop..

On Sun, 14 Aug 2022, 08:32 TSHINGOMBEKB TSHITADI,
<tshingombekb@gmail.com> wrote:

Department high education and training

Republic of South Africa

National certificate

. examination electrotech

. Time .

Marking guidelines consist 12page

Chief marker

Internal moderator

MC

Concession

Reduce marks for questions 7.2 by 6 marks

Mark all candy out of total 94 marks

Convert the mark achieve out 94mark

Record the percentage achieve on the market sheet

Total 10

Questions 1 DC machines explain

1.

Questions 2 AC circuit theory

Explain three phase circuit..

Questions 3. Transformer

3.1 explain

Questions 4. AC machine alternator..

Questions5.. AC machine synchronous motor.

Questions AC machine induction motors Questions 7. generation and distribution of AC

National certificate examination

Mathematics n6./ Level 6/ .nqf 6. ...

Time 3hours.

Marks:100

Instruction and the questions.

2.read all the questions carefully.number according used.

Questions.1.

1.1 given $z = 1/\cos.\cos.\cos (5x+2y)$

Determine minimum..

Partial $z/\text{partial } /x$ gradient . Variation differential.

1.2 given $x=1+2t$ and $y=3/1+2t..$

Determine

1.2.1. $Dy/DX.$

1.2.2 $d.dy/d.x \ x$

Questions 2

Determine integral ydx if

2.1 $y=e \exp- 3x \cos 3.x$

2.2 $y=-e-6x$

2.3. $y=\tan.\tan.\tan.\tan.4x..$

2.5 $y = \ln(1/x)$

Questions 3.

Use partial fraction to calculate the following integrals.

3.1 integral. $\frac{x^3 + 2x^2 - 4x - 11}{(x+3)(x-1)} dx$

3.2 integr $\frac{6x^3 - 4x + 10}{x(x^2 + 2)} dx$.

Questions 4.

4.1 determine the particular solutions of $x \frac{dy}{dx} - 2y = x^3 \cos x$ at $(2;1)$

4.2 determine the general solutions of $\frac{d}{dx}(x \frac{dy}{dx} - 2y) = e^{2x}$

Questions 5

5.15.1.1 determine the points of intersection of the graphs of $y = 2x$ and $y = 2 - 1/2x$.

Sketch the graph and show the area bounded by the graph of and the axis

Show the representative strip / rment you will use to calculate the area.

5.13 calculate the area described in question .

5.1.4 calculate the area moment about the y axis as well the dosity from y axis of then centroid of the area in .

5.3 sketch the graphy of $x^2 + y^2 = 49$.

Show the area in the first quadrant bounded by the graph ,the line $y=2$, $y=5$ and the y axis, show the representative strip you will use to calculate the volume when the area is rotated about the y - axis.

5.2.3 calculate the volume generated when the area described in

question 5.2.1 rotated about the y - axis.

5.2.3 calculate the distance from x axis of the centre of gravity of the solid obtained when the area in question rotates about the y - axis

5.3 5.3.2 sketch the of $y = \cos x$ and $y = \sin x$ for $0 < x < \pi/2$

Show the area bounded by the graphs and y- axis. show the representative strip you will use to calculate the area.

5.3.2 calculate the area described in question

5.3.3 calculate the second moment of area about y -axis of the area described.

5.4.1 the cross section of water tank is the form of trapezium the bottom the tank is 4m wide the top is 4 m wide and the height of the tank is 4 the tank is full of water sketch the cross section of the tank and show the representative strip you use to calculate the area moment. Verify the area of the tank.

Calculate the relation between the variable x and y

5.4.2 calculate the area moment of a vertical end of tank about the water level

5.4.3 calculate the depth of centre of pressure on the vertical end of the tank if the second moment of area is given as $69,333 \text{ M}^3$

Questions 6

6.1 calculate the length of the curve

$y = x^3/4 + 1/3x$ from $x=0$ to $x=4$

6.2 calculate the surface area generated when the curve $c = y - 9$ for $y < 10$ is rotated about the x axis

Total 10

Department of higher education and training

Republic of South Africa, ..St peace college

Non national certificate installations rules second papper

time

:3hours .marks 1000.

1. Answer all the questions
- 2.read all the questions carefully.
3. Number the questions according number.

Even though explicit started in question.all the questions carefully.

Number..sabs dan.aswr word perfect .

7. Candidate must pass papper 1 and papper 2.with 50% each.both examination rwrite. During the same exam period must be pass 12 month auther wise re rwrite.. statement of resul issue for accreditation purpose statement of results will be issued candidate meet prescription of the labour .use pen black.

Questions 1. Sans 10114-1 2017 installation requirements current carrying capacity of conductor and cables. Six cables of the dames size installed on metre deep in a trench that has an average soil temperature of 30 c each cable a sustain current carrying capacity of 66.52A.and thermally resistivity of the soil is 0,9 km/w there is not space between cables.

1.1Calculate the standard rating of each 1.2.cable installed in pipes and buried in the ground.

Questions 2; sans 19142-1 of 2017 installation requirements installation of conductor and cables .

3.1 wath are the indentification for a conductor.

2.2 state eight instance where PVC insulated multicore cable with a bare Earth conduct and cable with metal stiffening may be used .

Questions 3. Sans 10152-1 of 2017 installation requirements:

distribution boards.

Briefly explain the requirements regarding warning label that shall be fitted to all distribution board.

Questions 4

Sans 10142-1 of 2017 verification and certificate prospect short circuit current.

4.1 give the formula to calculate the source transformer and explain each item formula.

4.2 calculate the estimated length of 70mmx4core aluminium cable with an impedance of 0,0263 Ohms

Questions 5 sans10142-1 of verification and certification testing.

. Briefly explain how following test can be performed:

5.1 continuity of bonding.

5.2 resistance of the earth continuity conductor.

5.3 voltage. Available load (worst conditions)

Questions 6: sans 10142-1 verification and certificate test reports..

6.1 state three test reports applicable to this of sans.

6.2 name four of the five type of electricity supply system mention in section 2.(Installation of the test report typical of electricity supply system mention in section installation of the test report.

6.3 state five electrical test that can be performed at the distribution board . with supply available and can only be performed using a test.instrumnet.

Questions 7 sans10142-1 of 2017. Installation component. Install fixed electrical installation .

Questions 8. Sans 10142-1 of 2017. Calculation of voltage drop.

Calculate the following from the diagram.

8.1 the estimated cable size between the transformer and the

db.the no load voltage measure at the db is 225v.

8.2 the maximum distance allowed between the db and the pump.

Transformer 11kv/230v 0.9pf single phase....20 m .. distribution board 80 a 225 v no load ..4mm x3 Coren..pump 1 phase 5kw/230va..

Questions 9. Sans 1014 of annex earthing arrangements and equipotential bonding of information technology installation for functional purpose.

State the conductor that may be contained to the earth busbar of information technology installation.

Question 10:..sans 1973-3 of 2008; safety of assemblies with a rated prospective short circuit current of the up to and including 10 kA: busbar and wiring system ..

True false

10.1 the current density of phase busbar shall not exceed 2,0 A/mm for busbar current up to and including 630A.

10.2 the sizes and designs of phase busbar shall not exceed that could occur at the supply terminal of assembly.

10.3 standard colour coding. Red yellow blue or number L1,L2,L3, shall be used to identify a phase busbar

10.4 green /yellow shall be used for the earthing busbar and black for the neutral busbar.

10.5 if colours are used for control wire coding any colour may be used except green yellow and green black..

10.6 electrical equipment shall be selected in accordance with the used technical and installation knowledge for enclosed assemblies.

10.6 electrical equipment shall be selected in accordance with the user technical and installation knowledge for enclosure.

10.the power loss and dissipation capability of the assembly may be exceeded if monitored.

10.9 the dimensions of the joining plates (fish plate) of the busbar

shall be similar to those of busbar and the overlap on each side shall be at least equal to the width of the busbar..

10.10 conductor installed within a fault free zone need not be insulated where they could touch conductive parts..

Installation component stand fixed electrical

..from the point of control to the point of consumption..stove coupler socket wall nice vc switch .isolation transformer.lamp metall firing circuit breaker terminal earth leajagr

Sans10142-1:2017.

Multicore PVC insulated armoire cable sans 1507 voltage drop bbper amper meter aluminium conductor.

Conductor operating temperature 70.

Conductor cross sectional area.two core d.c.two core cable. MV/a/MB .4,5..r,x,z...////three core or four core cable phase a.c MV/A/m. r,x,z 3.9. ..

In the case of single circuit the return path has been account for the given.

..

Correction factor for soil temperature maximum conduct temperature 70 Celcius.

Soul tempera.correction cable buried directly in pipes in the ground....

Therminal resistivity soil km/w..cable buried directly in ground..cable installed in pipes buried in ground ..the correct factor have been average over range size consult ..cable..Cary curent neutral correspond reduced load phase ..

Unbalance circuit.. harmony.. impedance of 6000/1000

On Sat, 13 Aug 2022, 14:48 TSHINGOMBEKB TSHITADI,
<tshingombekb@gmail.com> wrote:

Formal technical INSTRUCTIONS in the ra report 191.. n
n3. ..191..

I'd evaluation saqa application 2019113002/20200130540

Formal RSA 191. Assessment task the icass trimester engineering
studies .2010002023812/2004007064381/2011007434332.. subject
week 2,4//,5,6//8total 2test natural science engineering..

75 78 lecture day general business services lecture.

Analysis grid for all test and must be submitted for Pre assessment moderation..

Subject level learning objectives//questions/formative/short responses /medium response/extend response /mark allocation /Toal mark.multiple choice medium response short explanation description required a couple's of sentences .extere response long explanation required.pre assessment moderate process lecture response settings a test assessment task.pre assessment.. responsibility time hod.. subject lecture trimester semester manage due.technical criteria content coverage..final approval of the assessor check layout font submit.. analyse grid.1.2subject aim learner objects are listed.conceptual visual level indicator per questions instruc.spread concept..formal cleared correct check page break spacing criterion content..content lecture subject assessment file item file.class registered subject syllabus work schedule plan work plant pace .plan lesson and teaching resources.

Evidence of additional support task as required improve.munite of subject meeting.does does the assessment file containing,. moderator report.evidence of post assessment moderate handwrite or ... subject.level.program drop total.percentage total plane .. trimester assessment task tool content duration mark moderator submission date Pre assessment.assement date completion date of post moder..

1.Subject. Years.... trimester ..

icass trimester mark sheet..Cass mark task

.final icass mark..test..test convent the mark to weighted /%total 100..

Irregularity..forfeit resultat be suspended from writing exam for 11month..exam adminission permit and examination instructions....

Check.

Task efficiency time management.. standard required.correctly per the standard required.4_5. Required struggle management

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
ELECTROTECHNICS N6
TIME: 3 HOURS
MARKS: 100

Enquiries
: Pierre de
Villiers
Tel: 012
312
5545
/ 082

697 0982

E

-

mail:

devilliers.p@dhet.gov.za

TECHNICAL AND VOCATIONAL
EDUCA

T

ION AND TRAINING (TVET)

COLLEGE ACADEMIC

CALENDAR FOR 202

2	53
NATIONAL CERTIFICATE	53
VOCATIONAL (NCV)	Term 4
ANNUAL	2
STAFF	6
COMMENCES	September
CLASSES	2
COMMENCE	6
CLASSES END	September
EXAM DATE	2
COLLEGES CLOSE	8
LECTURING DAYS	October
LECTURING	Life Skills & Computer Literacy
STAFF	(
S	P2
ERVICE)
DAYS	:
Term 1	24
17	-
January	2
24	8
January	October
01 April	Examination:
Supplementary Examination	31
:	October
21 February	-
-	30
1	November
6	0
March	2
01 April	December
49	2
54	5
Term 2	5
11 April	0
11 April	YEAR TOTALS
15 June	:
15 June	1
4	70
4	20
4	1
4	REPORT 191:
Term 3	BUSINESS AND UTILITY
04 July	STUDIES
04 July	SEMESTER
16 September	STAFF
14 Days for the Internal	COMMENCES
Examinations	CLASSES
16 September	COMMENCE

CLASSES END	04
EXAM DATE	July
COLLEGES CLOSE	1
LECTURING DAYS	1
LECTURING	July
STAFF SERVICE	1
DAYS	6
Semester 1 Term 1	September
1	1
7	6
January	September
2	4
4	8
January	53
01 April	Semester 2 Term 4
01 April	2
49	6
54	September
Semester 1 Term 2	2
1	6
1	September
April	0
1	7
1	November
April	Computer
2	Related Subjects
0	:
May	01
Computer	-
Related Subjects	07 November
:	Examination:
17	0
-	8
23 May	Nov
Examination:	ember
2	-
4	30 November
May	0
-	2 December
1	31
5	5
June	0
1	YEAR TOTALS
5	:
June	15
26	4
4	20
4	1
Semester 2 Term 3	

REPORT 191: NATURAL	6
SCIENCE STUDIES	93
TVET LETTERED	Trimester
CIRCULAR NM	2
(Dated 27 July 2021)	10
STAFF	August
COMMENCES	15
CLASSES	August
COMMENCE	11
CLASSES END	November
EXAM DATE	14
COLLEGES CLOSE	November
LECTURING DAYS	-
LECTURING	02 December
STAFF SERVICE	02 December
DAYS	6
2021 T3 Candidates	5
Prep,	83
Revision and	YEAR TOTALS
Examinations	:
1	14
7	1
January	201
17	NOTES
January	PUBLIC AND COLLEGE
28 January	HOLIDAYS
31 January	1 JANUARY
-	NEW YEAR'S DAY
18 February	The Calendar was set taking
18 February	cognisance of the late
1	release of results in Engineering
0	Study.
25	The
Trimester	I
1	nternal
28 February	E
1	xaminations may be conducted
6	either in the second or third
March	term, for a maximum of fourteen
24	days
June	for NC (V) candidates
27	.
June	21 MARCH
-	HUMAN RIGHTS DAY
15	15
July	APRIL
15	GOOD FRIDAY
July	18
6	APRIL

FAMILY DAY

Lecturing staff service days when no students are on campus MUST be utilised for lesson planning, assessment planning, subjects and

faculty meetings, lecturer training, work integrated learning and work

-

based experience, and administrative work.

27 APRIL

F

REEDOM DAY

1 MAY

WORKERS' DAY

The NC (V)

Supplementary

E

examinations should not impede teaching contact time

2

MAY

PUBLIC HOLIDAY

16 JUNE

YOUTH DAY

1

7

JUNE

COLLEGE HOLIDAY

08 AUGUST

COLLEGE HOLIDAY

9 AUGUST

NATIONAL WOMEN'S DAY

No deviation

from this approved calendar is allowed without prior approval by the Director

-

General of the Department of Higher

Education and Training.

24 SEPTEMBER

HERITAGE DAY

16 DECEMBER

DAY OF RECONCILIATION

25 DECEMBER

CHRISTMAS DAY

26

DECEMBER

DAY OF GOODWILL

DR PHIL MJWARA

ACTING

DIRECTOR

-

GENERAL: HIGHER EDUCATION AND TRAINING

DATE:

27 SEPTEMBER 2021

vet Colleges School Calendar 2022

Tvet Colleges School Calendar 2022

In South Africa, there are fifty registered and certified public TVET colleges operating on 364 campuses across the country's rural and metropolitan areas. The Continuing Education and Training Act 16 of 2006 authorizes the establishment and operation of public TVET colleges, which are administered by the Department of Higher Education and Training.

The acronym for (Tvet) is Technical Vocational Education and Training. Tvet is a term used in international education to express the growth of individual abilities and businesses. A Tvet college is also the greatest alternative for you if you want to establish your own business or learn new practical skills. Tvet Colleges are frequently focused on educating students to work as functional workers in their skilled trade of choice.

Agriculture, arts and culture, business, hospitality, commerce

and management, education, training and development, engineering, manufacturing and technology, services, building construction, and security are among areas where TVET Colleges can provide courses. Tvet Colleges School Calendar 2022

Tvet Colleges application open date:

The Technical and Vocational Education and Training (TVET) Colleges Online Application for 2022 opens on 1 September and closes on 30 November. Therefore, all those who want to apply for TVET College Online should do so before the application deadline.

Read: [lecturer vacancies tvet colleges](#)

Tvet colleges application documents needed to apply:

The following documents must be submitted due to applying to the college:

A unique/valid Email address and cellphone number
3 certified copies of ID of Parent/Legal Guardian
3 certified copies of ID of Learner
South African applicants will need an ID number.
Foreign applicants will need their certified copies of passport numbers.
Copy of your school qualifications (eg Senior Certificate)
A certified copy of your latest results/Grade 9 or Higher;
Proof of Residence.
SAQA approved foreign

qualifications
Proof of medical insurance or cover
Valid study permit

Tvet Colleges School Calendar 2022

How to Make an Application

Get your application form first.

All new applications are now available online:

I consent to the TVET College using my e-mail address and cellphone number to communicate with me throughout the application process. During the application process, please make sure you include a valid and working e-mail address as well as one telephone number.

Step 2: Fill out the application form completely.

E-mail, ID, and cell phone number verification. Your ID, e-mail, and cell phone are used to verify your identity.

Step 3: Ensure that all supporting documents are attached.

All applicants who are beginning a new qualification must submit the following certified documents:

Birth Certificate/Identity Document (Proof of New ID/Passport Application)
Certificates/Qualifications
Recent Academic Achievements
Other account statements/billing documents for municipalities (not

older than 3 months)
a current study permit (Foreign
national students)
The Evaluation Certificate of the
South African Qualification
Authority (SAQA) (foreign
qualifications).

**Step 4: Fill out and submit
your application.**

You will receive a confirmation
email containing all application
details.

**TVET Colleges Schools
Calendar for 2022**

National Certificate Vocational
(NCV)
Term 1 (L2)

Term 1 consists of 48 lecturing
days.

Classes start 25 January
Classes end 1 April
Supplementary Examinations 10
March - 1 April
College closes 1 April

Term 1 (L3 & L4)

**Term 1 consists of 38
lecturing days.**

Classes start 8 February
Classes end 1 April
Supplementary Examinations 10
March - 1 April
College closes 1 April

Term 2 (L2, L3 & L4)

**Term 2 consists of 44
lecturing days.**

Classes start 12 April
Classes end 14 June
College closes 14 June

Term 3 (L2, L3 & L4)

**Term 3 consists of 51
lecturing days. There are also
14 days for internal
examinations.**

Classes start 8 July
Classes end 17 September
College closes 17 September

Term 4 (L2, L3 & L4)

**Term 4 consists of 23
lecturing days.**

Classes start 27 September
Classes end 27 October
Exam Dates 28 October - 26
November
Life Skills & Computer Literacy
(P2) 21 - 27 October

College closes 8 October

**Report 191: Business And
Utility Studies**

Semester 1 Term 1

**Semester 1 Term 1 consists of
48 lecturing days.**

Classes start 25 January
Classes end 1 April
College closes 1 April

Semester 1 Term 2

**Semester 1 Term 2 consists of
28 lecturing days.**

Classes start 12 April
Classes end 21 May

Exam Dates 24 May – 14 June
College closes 14 June

Semester 2 Term 3

Semester 2 Term 3 consists of 47 lecturing days.

Classes start 14 July
Classes end 17 September
College closes 17 September

Semester 2 Term 4

Semester 2 Term 4 consists of 30 lecturing days.

Classes start 27 September
Classes end 8 November
Exam Dates 9 November – 30 November
College closes 8 December

Report 191: Natural Science Studies

Trimester 1 (N1, N5, N6)

Trimester 1 (N1, N5, N6) consists of 47 lecturing days.

Classes start 25 January
Classes end 31 March

Exam Dates 1 April – 23 April
College closes 23 April

Trimester 1 (N2, N3, N4)

Trimester 1 (N2, N3, N4) consists of 37 lecturing days.

Classes start 8 February
Classes end 31 March
Exam Dates 1 April – 23 April
College closes 23 April

Trimester 2

Trimester 2 consists of 45 lecturing days.

Classes start 20 May
Classes end 22 July
Exam Dates 23 July – 13 August
College closes 13 August

Trimester 3

Trimester 3 consists of 47 lecturing days.

Classes start 8 September
Classes end 12 November
Exam Dates 15 November – 3 December
College closes 8 December

The Internal Examinations

may be conducted either in the second or third term, for a maximum of fourteen days for NC(V).

Qualifications within the South African NQF, as amended (March 2017) stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

SAQA bases the advice below on information currently available to it. SAQA reserves the right to change this advice should new authoritative information come to its attention.

Our online application document stipulates the following in terms of schooling qualifications:

"SAQA accepts only school leaving qualifications issued by the official examining / certification body in the country of origin, and not by the school, where based on external examinations.

No Certificates of Evaluation will be issued for school leaving documents other than those in respect of completed, national school exit qualifications issued by the relevant authorities."

Therefore, only school leaving qualifications correctly awarded by the authorised national examination body in the Democratic Republic of Congo will be recognised and not school leaving documents issued by the school itself.

Please note the purpose of this overseas institutions email is to give people some direction regarding accredited and non-accredited foreign institutions for the purpose of recognition and acceptance by SAQA for foreign qualifications evaluation.

Kind regards

Authentication Services

SAQA

The National Qualifications Framework (NQF) Act 67 of 2008 mandates SAQA to provide a foreign qualifications evaluation and advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements

that a foreign awarding institution must meet for its qualifications to be recognised.

From: tshingombe<tshingombekb@gmail.com>**On Behalf Of** tshingombe
Sent: Friday, 08 July 2022 14:54
To:foreigninstitutions<foreigninstitutions@saqa.co.za>
Subject: Foreign institutions inquiries: #6594

Name:	tshingombe
Country:	South Africa
Purpose:	Check status before applying for evaluation
Email:	tshingombekb@gmail.com
Institution:	Saqainstituts St peace college Africa institute police ..tshingombe
Institution physical address:	CNR chruits strut marketer house ..jhb carton center
Website:	tshingombekb@gmail.com
Comment:	Hello dear submitted for examination award degree diplomat final completed bulletin certificate RSA dr Congo student apply dhet examination was irregularities kgaka for reasoning saqa no meet award final Rd Congo n6n5n6.educare and engineering electrical technical .. education technical . pedagogy technical.. science math info



Foreign Institutions

Sun, Jul 10, 12:25
PM

Thank you. SAQA has received your enquiry and will respond to it within two working days, unless further research and/or consultation is

required. Your Referenc



TSHINGOMBEKB
TSHITADI<tsHINGombekb@gmail.com>

Tue, Jul 12, 9:54
AM

**High education department / saqa / st peace college portfolio
tshingombe tshitadi**

**1..register saqa admin .national framework regulatory
qualifications . institutes foreigners/**

Credit subject entry .nqf1.12..

Award diplomat work day certificate.1th,,[2.th.](#),,3th,,4th level

I'd number submitted.. record

Academic transcript learner student lecturer..

N national certificate diplomat.

Credit equivalent entry evidence explain

50%..50/100..equivalent. award minimum. meeting

Name surname credit accredit minimum

I'd/name/years qualifications//provision//. Move file in out

I'd	Name surna me	years qualifica tions	provis ion	file stud ent	submi tted docum ent file	Course s attend ance	exam atten ded
Total Entry Move Perform ance							

Move file submission student term 1,2,3,4,5,6 / semester periodic record / 3month entry 2 week lecture move ,

Subje ct File stude nt	subje ct	ter m	year s	scor e	Final mark s	Fina l poin t	Finl submi ss doc	Fina l att	Fina l exa m

1.register national examination ,

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Test circuit.nice erroneous value home.

Test operational Commission.

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Operational control

Good

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Designing... workplace workshop..

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<tshingombekb@gmail.com>

Aug 20, 2022, 9:03 PM (14
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to
me

Check.procedure check calibration operationa explanation material
conduct insulation magnetic Armie conductor low.

AC.rc current installation check panels check. Calibration operational
current formula low.

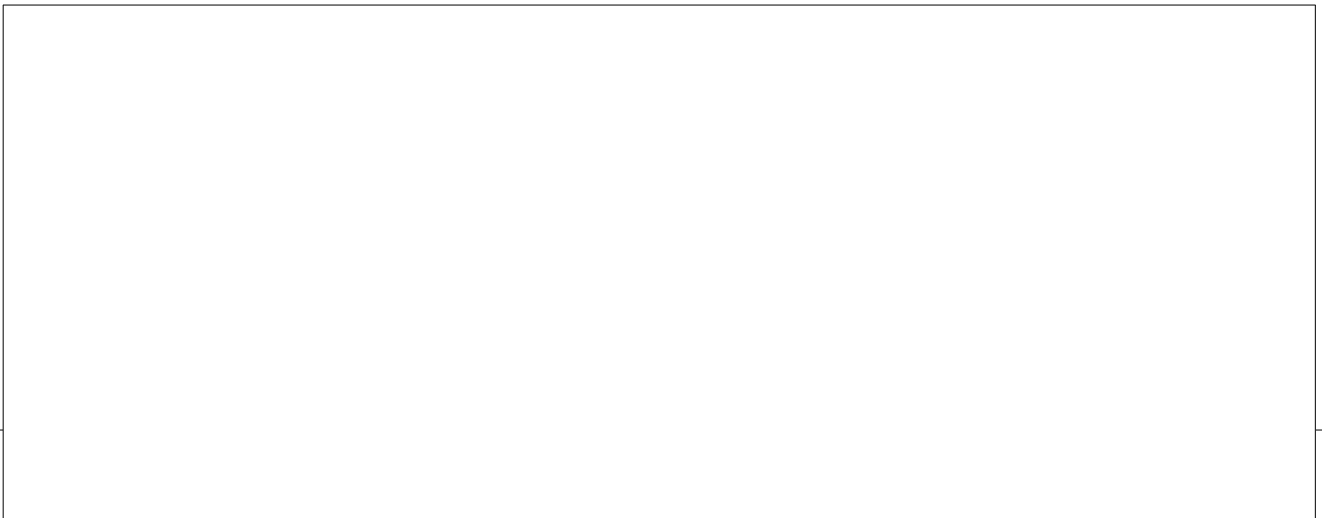
Resistivity conductive aupra conductivity impedance.z. $1/z, 1/r$ resonance
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1. Tools assessment .mark Check

Measure installation.

voltage voltmeter.amperemeter,watermetet,voltmeter etalon kWh
cosmeter care meter ohmeter...calibration check material checking
conductivity, insulator.magnetics., resistance check field magnetic flux
meter light ..cell densimeyer checking..

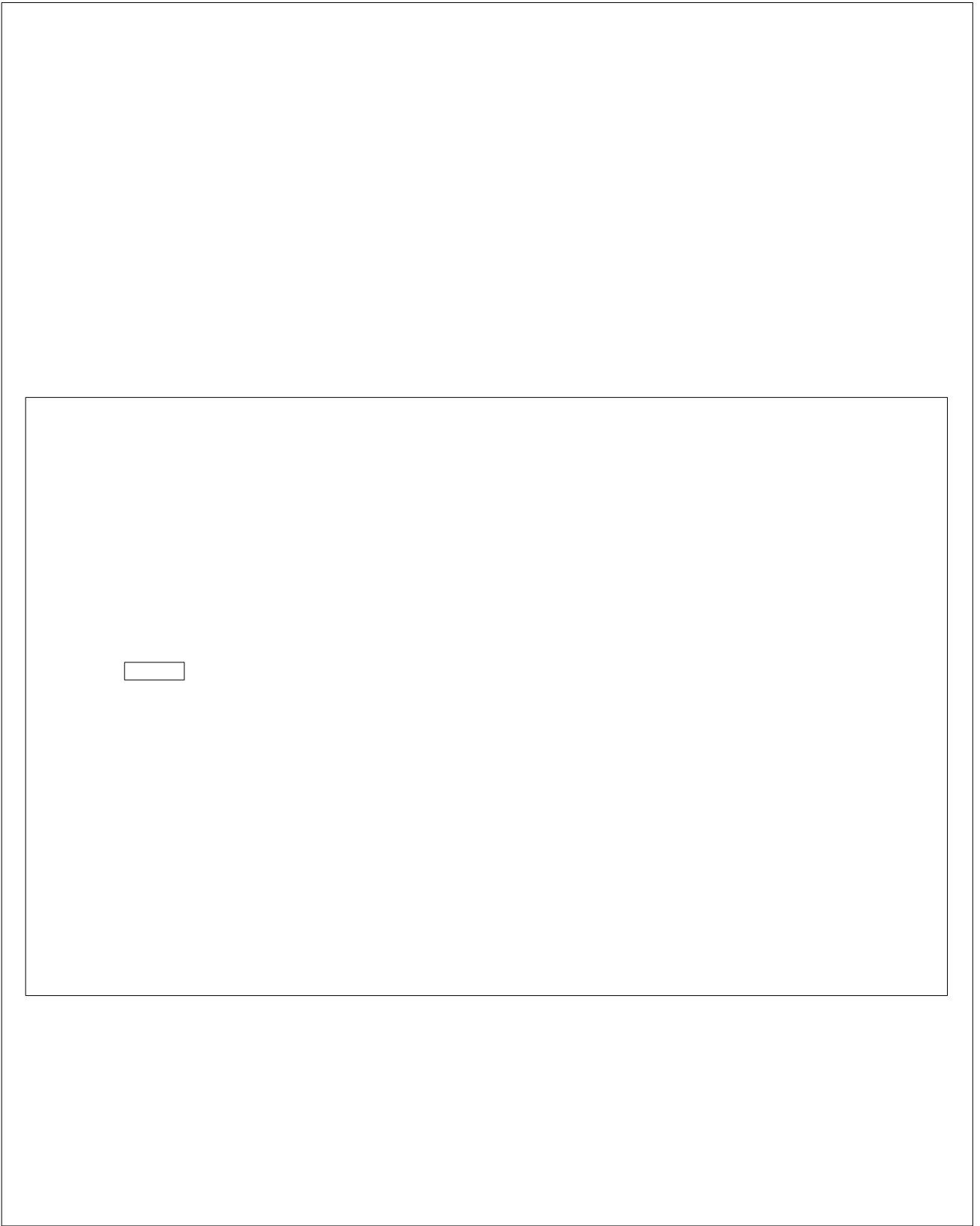
Power factor maximum demand check

Diagram illustrating the components of a power meter, organized into two rows:

- Top Row (Labels/Outputs):**
 - volmeter
 - amete
 - W
 - kwh
 - kvhr
 - COS
- Bottom Row (Inputs/Fields):**
 - V (Voltage input field)
 - A (Current input field)
 - (Empty input field)
 - (Empty input field)
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 - (Empty input field)

SPECIFIC QUESTION ASSESS ENTRY /POWER OUTCOM
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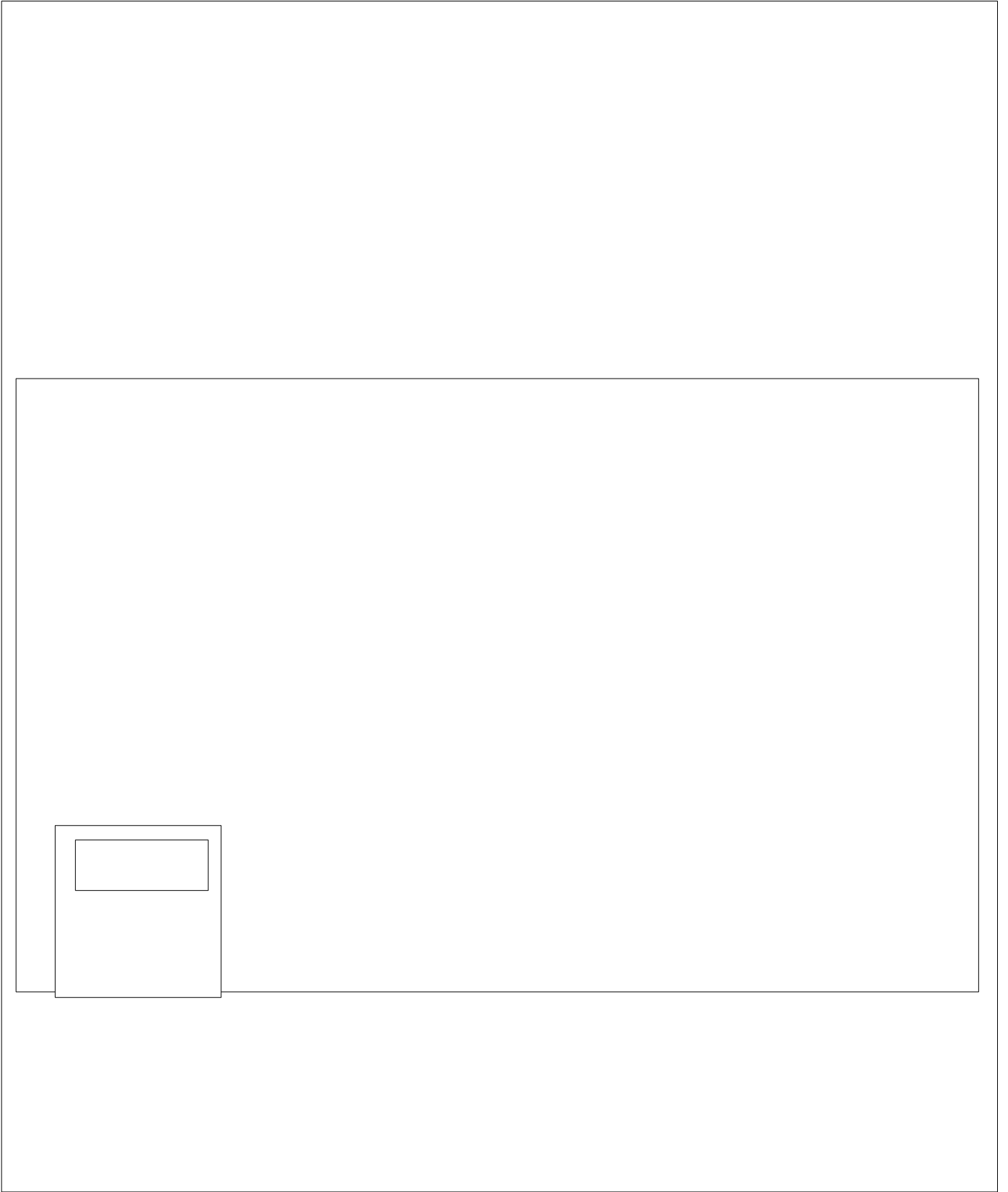
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A	V	W	KWH	KVARH	COS
---	---	---	-----	-------	-----

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TEST VALUE NOMIN MIN	A	V	W	KWH	KVAR H				
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POWER

TORQUE

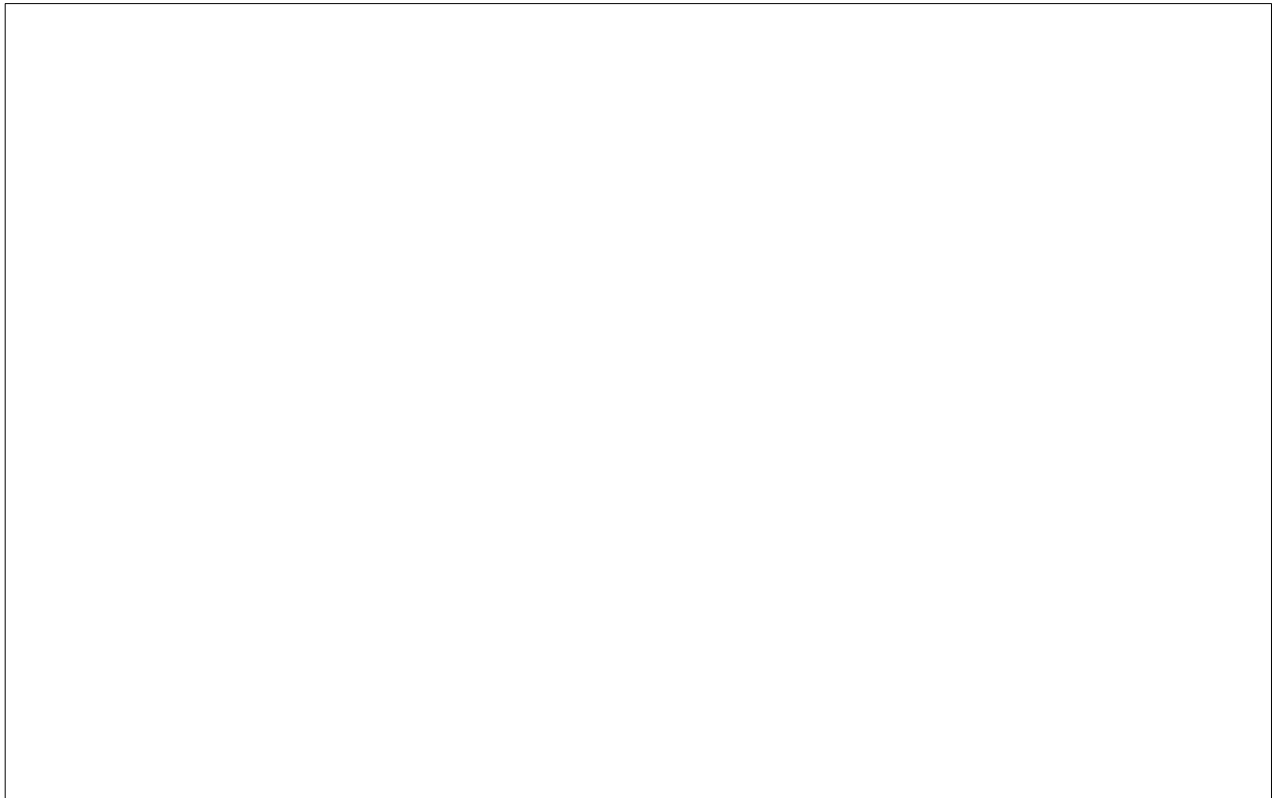
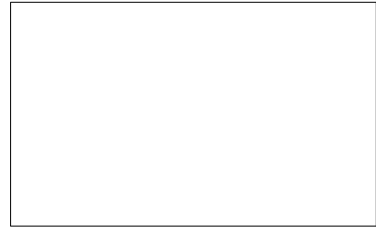
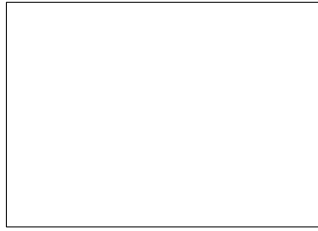
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VALU E	FORC	KG	TR/ MI	N/ MIN	CALO	KWH	POW	TORQ	DEGR EE
LOAD MIN LOAD MAX									

	ALGEBRAIC	RIGOROUS	GEOMETRY	MENSURATION					
VALUE									
MEAN									
MIDPOINT									

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Aug 20, 2022, 9:14 PM
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to
me

Test orthographic projection

Assessment police tools control circuit

Test framework regulatory mandate low.skill admnise communication
test communication strees .manage system information test info
recruitment system activity over stocks test simulation control circuit
phase crime analyse source data ..humain induction management system
planning test orientation careers.. theory crime incidence evidence
test ..crime investigation principle evidence trial test

Paralegal Deb financial test, delivery test assessment activities .file
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Exam , test circular

INSTRUCTIONS AND INFORMATION

Answer ALL the questions.

Read ALL the questions carefully. Number the answers according to the numbering system used in this question paper.

Round

off ALL calculations to THREE decimal places.

Use the correct symbols and units.

Start each question on a NEW page.

Keep subsections of questions together.

ALL circuit diagrams and vector diagrams must be at least one third of a page and must be fully labelled.

Write neatly and legibly.

QUESTION 1

1.1 Draw and explain the operation of a Ward Leonard control system, controlling the speed and direction of a large DC shunt motor.

(7)

1.2A 250 V, DC series motor runs at 1 000 r/min while drawing a current of 40 amperes from the supply. The resistances of the armature and series field

are 0,25 ohms and 0,1 ohms respectively. Calculate the speed at which the motor will run if a 0,2 ohm resistor is connected in parallel with the field

oil. Assume that there is a 20% increase in the torque and that the field coils are unsaturated.

(2) 1.3 Draw TWO fully labelled circuit diagrams used to solve QUESTION

1.2, clearly showing the current flow in both diagrams.

QUESTION

2

An alternating voltage represented by the expression; $v = 30 \sin (314t + 25^\circ) + 10 \sin (942t - 30^\circ)$ is applied to a resistor of 180 ohms in parallel with a capacitor of

25 micro

-

farads.

Determine:

2.1

An expression for the instantaneous value of current

(8)

2.2The power factor of the circuit state the nature of the power factorThe energy dissipated in the circuit in 10 milli

-

seconds

(1)

2.4Draw a large vector diagram clearly showing the voltages and currents for the fundamental as well as the harmonic component.

QUESTION 3

3.1

State TWO constant losses occurring in a transformer and state precisely where each occurs.

3.2

A 250 kVA, 3 300/240 V, single

-phase transformer produces a maximum efficiency of 92% at 80% of fullload.

Calculate for a power factor of 0,85 lagging:

3.2.1The iron losses

(2)

3.2.2The full

-load copper losses

(2)

3.2.3 The percentage resistance

(4)

3.2.4 The per unit full load voltage regulation of the transformer when it works at unity power factor

(2)

[14] QUESTION

4

4.1

What do you understand by the distribution factor of a synchronous alternator?

(3)

4.2

The following information applies to a three phase, star connected alternator: Open

-circuit terminal emf = 3,3 kV Frequency = 50 Hz Speed = 1 000 r/min

Number of slots/pole/phase = 4 Coil span = 150° Useful flux per pole = 55 mill webers

Calculate the possible number of conductors per slot.

(12)

[15]

QUESTION

5

A 380

V, 50 Hz, three

-

phase, star-

connected synchronous motor has an induced emf of 500 volts. The synchronous impedance of the motor is $(1,5 + j 4,8)$ ohms per phase.

For a load angle of 25 degrees electrical, calculate:

5.1

The current drawn by the motor

(7)

5.2

The power output of the motor if its efficiency is 85%

(3)

5.3

Draw a fully labelled vector diagram that

you would use

to solve this example

.

(2)

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QUESTION

6

A 525

V, 6 pole, 50 Hz, three

-

phase, delta

-

connected induction motor develops 28 kW

when running at a speed of 950 r/min. The rotor iron loss is negligible and the frictional

loss in the

bearings is 800 watts.

For a power factor of 0,8 lagging, calculate:

6.1

The percentage slip at which the motor is operating

(2)

6.2

The rotor copper loss

(2)

6.3

The power input to the motor if the total losses occurring in the stator amounts

to 1 080 watts

(2)

6.4

The current drawn from the supply

(2)

6.5

The efficiency of the motor

(3)

[11]

QUESTION 7

A large industrial consumer takes 1 MVA at a power factor of 0,75 lagging. To reduce

maximum demand, a capacitor bank

was installed and the overall power factor was

improved to 0,9 lagging.

Determine:

7.1

The size of the capacitor bank

(5)

7.2

The cost of the capacitor bank

nk if it sells for R295 per kVA

(2)

7.3

How many months it will take to pay off the capacitor bank using only the savings in maximum demand charges? Assume that the consumer pays a maximum demand charge of R132 per kVA.

(4)

7.4

Draw a neat

fully labelled vector diagram clearly showing the maximum demand before and after the installation of the capacitor bank

(2)

[13]

TOTAL:

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QUESTION 1

1.1

Given

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ln

z

x

y

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P
rove that

1

zz

xy

xy

xy

$\partial \partial$

=+

$\partial \partial$

+

(3)

1.2
The radius

(

r

)

of a right circular cylinder increases from 4 cm to 4,1 cm and its height

(

h

)

increases from 20 cm to 20,5 cm.

Calculate its approximate change in

volume.

2

V

r h

π

=

(3)

[6]

QUESTION 2

Determine

$y dx$

\int

if

:

2.1

(

)

2

1

38

y

xx

=

-+

(4)

2.2

ln 2 ln

y

x

$$\frac{x}{2.3} = \frac{1}{2} \tan x$$

$$\frac{y}{x} + \frac{3}{\sin x} = \frac{2.4}{\cos x}$$

$$\frac{y}{x} + \frac{3}{\sin x} = \frac{2.5}{\cos x}$$

$$(3)$$

[18]

QUESTION 3

Use partial fractions to calculate the following integrals

$$\int \frac{3.1}{2x^5 + 55x^2 + 61} dx$$

$$\int \frac{x^2 + x + 1}{x^2 + 1} dx$$

$$(5) \int \frac{3.2}{32}$$

2
 2
 6
 12
 (
 3)(
 3
 4)
 xx
 dx
 x x
 x
 x
 --+
 +
 ++
 f
 (7)
 [12]
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4
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 QUESTION 4

4.1
 Determine the particular solution of
 32
 dx
 yx
 dy
 =-
 at (1;0)

(5)
 4.2
 Determine the particular solution of
 2
 3
 2
 6
 9
 18
 x
 d y
 dy

$\frac{dy}{dx}$
 $\frac{dy}{dx}$
 $-$
 $++=$
 when
 $1;$
 0
 $2;$
 0
 $\frac{dy}{dx}$
 y
 x
 and
 x
 $\frac{dx}{dx}$
 $=$
 $=$
 $=$
 (7)

[12]

QUESTION 5

5.1

5.1.1

Sketch the graphs of

$2 \ln$ and

2

y

x

y

x

$=$

. Show the area bounded by the
graphs, the x

$-$

axis and the line

$y = 2$.

Show the representative strip that

you will use to calculate the area

.

(2)

5.1.2

Calculate the area described in QUESTION 5.1.1

(4)

5.1.3

Calculate the area moment about the y

$-$

axis as well as the

x

$-$

co

-
ordinate of
the centroid of the area described in QUESTION 5.1.1

(6)

5.2

5.2.1

Sketch the graph of
 \tan for 0

2

y

x

x

π

$=$

$\leq \leq$

.
The area enclosed by the
graph, the x

-

axis and the line

4

x

π

$=$

rotates about the x

-

axis. Show the
area and the representative strip
that you will use to calculate the
volume.

(2)

5.2.2

Calculate the volume generated when the area described in
QUESTION 5.2.1 rotates about the

x

-

axis

.

(3)

5.2.3

Calculate the moment of inertia about the

x

-

axis of the

solid obtained

when the area in QUESTION 5.2.1 rotates about the x

-

axis.

(5)

5.3

5.3.1

Sketch the graph of

$y = x^2$

for

$x \in [-1, 1]$

and

$y \in [0, 1]$

the

Show the area bounded by the graph,

the

x

axis,

the

y

axis

and the

line

$y = 1$

is

$x = 1$

is

. Show th

e representative strip that you will use to calculate the

area and

the

second moment of area.

(2)

5.3.2

Calculate the area described in QUESTION 5.3.1

(3)

5.3.3

Calculate the second moment of area about the

y

axis

of the area

described in QU

ESTION 5.3.1

(5)

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5.4

5.4.1

A triangular plate of sides 5 m, 5 m and 6 m is placed vertically in a canal which is 5 m deep. The longest side of the plate is horizontal and is 1 m below the water level.

Sketch the plate and show the representative strip that you will use to calculate the area moment of the plate about the water level. Calculate the relation between the variables x and y .

(3)

5.4.2

Calculate the second moment of area of the plate about the water level as well as the depth of the centre of pressure on the plate if the area moment is given as numerically equal to 28

m

3

.

(5)

[40]

QUESTION 6

6.1

Determine the length of the curve

2

9

y^x

$- =$

from

0 to

3

x

t^x

$= =$

(6)

6.2

Calculate the surface area generated when the curve

3

xy

$=$

for

0 to

y

$\leq \leq$

is

rotated

about the

y

-

axis

ndicate whether the followin

g statements are TRUE or FALSE by writing

only

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T

rue

,

or

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F

alse

,

next to the question number (1.1

-

1.10) in the

ANSWER BOOK.

1.1

O

utput is

a

quantity that must be maintained at a prescribed value.

1.2

A

linear variable differential transformer

is an electromagnetic device that can detect

mechanical rotary motion.

1.3

A steady

-

state error is a slow variation of the output voltage or current of the

amplifier when the input signal is maintained at

a constant level.

1.4

A gain margin

means

the gain corresponds to the point where the phase crosses the

180° line.

1.5

A control system is a mathematical expression describing the transfer of
data from

the applied input to the output of the system.

1.6

Overshoot is that part of the total response which approaches zero as
time

approaches infinity.

1.7

In a closed

-

loop system output has an effect on input in order to maintain the output at a desired value.

1.8

Overdamping is defined as the amount of damping that reduces the overshoot to zero when a system is excited by a change in the control value.

1.9

A second

-

order control system cannot become unstable because there are feedback elements that adjust and make the output uncontrollable

.

1.10

A stable system remain

s

at rest unless excited by an external source and return

s

to

rest once all excitations are removed.

(10 × 1)

[10]

QUESTION 2

2.1

Determine

,

with the aid of block diagram algebra, the controlled output (C) for the block diagram in FIGURE 1.

FIGURE 1

(6)

G1

G2

G3

G

4

R

C

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)

-

4

-

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Please turn over

2.2

Convert the Laplace transform function
below
to a function of time

$\frac{1}{s^2 + 23}$

Convert the function of time
below
to a Laplace transform function

$\frac{1}{s^2 + 10}$

QUESTION 3

DIAGRA

M SHEET 1 (attached) shows
a point

-
by

-
point

Bode diagram of the gain and
phase values of a system
with
the frequency

varies
from 0.1 to 100 radians
per second.

Determine
each of
the following from the graph:

3.1

G

ain crossover frequency

(1)

3.2

P

hase crossover frequency

(1)

3.3

P

hase margin

(1)

3.4

G
ain and phase values at a
frequency of 10 rad/s

(2)

3.5

G

ain corner frequencies

(2)

3.6

G

ain cut

-

off rates

(3)

[10

]

QUESTION 4

4.1

Plot the gain and phase values for
an open

-

loop control system on

the

attached

Nichols chart using the data in the table
below

.

ω (rad/sec)

Magnitude in dB

Phase in degrees

0.1

27

-

60°

0.6

18

-

95°

1

9

-

130°

12

-

2

-

150°

19

-

13

-

175°

24

-

24

-

195 °

(5)

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-

5

-

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4.2

Use the Nichols chart to determine
each of
the following:

4.2.1

G

ain margin

4.2.2

P

hase

margin

4.2.3

G

ain crossover frequency

4.2.4

P

hase crossover frequency

4.2.5

U

ndamped natural resonant frequency

(5 × 1)

(5)

[10]

QUESTION 5

DIAGRAM SHEET 2 (attached) illustrates
the

r

oot

l

ocus plot of a system as

an

amplifier gain varies from zero to infinity.

Use the
plot to determine
each of
the following:

5.1

O

pen

-

loop poles and zero

s

(3

)

5.2

S

smallest value of damping ratio that the system could have

(2

)

5.

3

D

damped resonant frequency

at

the

smallest damping ratio

(1

)

5.

4

U

ndamped resonant frequency

at

the smallest damping ratio

(1)

5.

5

G

ain constant

at

the smallest damping ratio

(

2

)

5.

6

F

requency at which the system becomes unstable

(1)

[10]

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6

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QUESTION 6

6

.1

Name T

WO

types of

resis

tive transducers.

(

2

)

6

.

2

Identify the terminals

of an operational amplifier shown in the diagram in

FIGURE 2. Write only the answer next to the letter (A

-

C) in the

ANSWER BOOK.

FIGURE 2

(

3

)

6.3

A summing operational amplifier is subjected to three input voltages of 8 V, 12 V and 24 V respectively.

The feedback resistance is 11 K Ω and all

input resistance is 50 Ω .

Calculate the

value of the output voltage

.

(

2

)

6

.

4

State THREE components of an optical relay.

(

3

)

[10]

QUESTION 7

7

.1

Name THREE types of systems in which synchros may be used.

(

3

)

7

.

2

State FOUR advantages of using AC servo motors.

(

4

)

7.3

Explain

breakaway voltage

with regard to

servo motors.

(

2

)

7.4

Name the type of rotary synchro that consists of

three stators and three rotor

windings connected to two transmitter stat

ors.

(

1

)

[10]

□

□

□

□

□

□□

□

□□

□

□□

A

B

C

(

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)

-

7

-

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QUESTION 8

8.1

Draw a neat, labeled

1

led schematic diagram of a
reversible half

-

wave

universal

speed

-

control circuit.

(

6

)

8.2

Define

feedback

with regard to a closed

-

loop control system.

(2)

8.3

Name

TWO

conditions

which can be improved

.

in the design and performance
of a system

.

(2)

[10]

QUESTION 9

9.1

Name TWO types of
spur

-

gear rotary pumps

.

(

2

)

9.2

A

certain type of rotary hydraulic pump is shown in the diagram in
FIGURE
3

FIGURE 3

9.2.1

Name the pump.

(1)

9.2.2

Identify

the indicated

parts of the pump by writing the answer next
to the letter (A

-

C) in the ANSWER BOOK.

(3)

9.2.3

Explain the operation of the pump.

(4)

[10]

(

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-

8

-

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QUESTION 10

10.1

Name the type of control required on a basic
pneumatic control system
to

counteract each of the following problems:

10.1.1

Sluggishness

10.1.2

Offset and
steady

-

state

errors

(2

×

1)

(2)

10.2

Define

hunting

with regard to proportional control.

(1)

10.3

A

proportional pneumatic controller
is shown in the diagram in FIGURE 4.

Explain the working principle of th
is

type of controller

.

FIGURE 4

(7)

[10]

TOTAL:

1

0

0

Bellows

Flapper

Output

Input

246)

-

3

-

C

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QUESTION 1

1.1

Use the
information
in

the given graph
and design
a filter for a $600\ \Omega$
transmission line.

Draw the comp

let

ed

f

ilter and insert all
relevant values.

(6)

1.2

Design a T

-

section filter network that will eliminate all frequencies between

the ranges of 7,5 kHz and 10 kHz for a 600

Ω

transmission line.

Draw the

completed network and insert

all

relevant values.

(

6)

1.3

Design the terminating half

-

sections for a low

-

pass

π

-

type filter given the

following specifications:

f

c

=

3,25 kHz

f

∞

=

3,75 kHz

Z

o

= 600 Ω

Draw the completed filter networks and insert

all

relevant component values.

(7)

[19]

□

□

□

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4

-

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UEST

IO

N 2

2.1

Draw
and fully label
each of
the following balanced attenuator networks:

2.1.1

π

-

type

2.1.2

L

-

type

2.1.3

T

-

type

$(3 \times 2$

)

(6)

2.2

A variable bridged T

-

ne

twork is required for a $600\ \Omega$

transmission line to give

attenua

ti

on betwe

en the ranges of 3 dB and 5 dB.

Obtain the maximum and minimum values for the potentiometers
required.

Draw the network and insert all relevant values.

(8)

[14]

QUESTION 3

3.1

Calculate the standing wave ratio for

each of

the

followin

g

loads connected to

a 600

Ω

transmission line:

3.1.1

$750\ \Omega$

(1)

3.1.2

$300 + j450$

Ω

(4)

3.2

Draw a neat, labelled sketch of a two

-

hole directional coupler.

(8)

3.3

Explain how the reactive component can be tuned out of a transmission line.

Use

a simple sketch

to

substantiate the explanation

.

(4)

[17]

QUESTION

4

4.1

The following information concerning a two

-

stage amplifier is given:

STAGE 1

STAGE 2

Gain

10

15

Input resistance

9 k Ω

20 k Ω

Equivalent resistance

12 k Ω

15 k Ω

Output resistance

18 k

Ω

30 M Ω

Determine the:

4.1.1

E

equivalent noise resistance

(5)

4.1.2

O

utput noise voltage for a bandwidth of 9 MHz and a temperature of 25

°C

(2)

□
□
□
□

(8080246)

-

5

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4.2

The input resistor to an amplifier has a value of $27\text{ k}\Omega$ and a frequency range

of 21

kHz to 30 kHz at a tempera

ture of $24\text{ }^{\circ}\text{C}$.

Determine the difference in noise voltage generated, should the temperature

be reduced to $18\text{ }^{\circ}\text{C}$.

Tak

e Boltzmann's constant as $1,38 \times$

10

-

23

J/K .

(3)

4.3

Explain

each of

the following

terms

and give a

mathe

matical expression to

substantiate each

explanation

:

4.3.1

Noise factor

4.3.2

Signal

-

to

-

noise ratio

$(2 \times 3$

)

(6

)

[16]

QUESTION 5

5.1

Draw a neat, labelled circuit diagram of a Class C modulator using an NPN

-

transistor.

I

ndicate

all

relevant waveforms.

(7)

5.2

Explain

the full operation of the Class C modulator in QUESTION

5.1.

(5)

5.3

Explain

sampling with reference to TDM.

Use

neat sketches to

substantiate

the

explanation

.

(6

)

[18]

QUESTION 6

6.1

I

ndicate

whether the following statement is TRUE or FALSE by writing only

'True' or 'False' next to the question number (6.1) in the ANSWER BOOK.

The gain of an antenna effectively increases the effective aperture of the antenna.

(1)

6.2

Define th

e

term

ba

ndwidth of an antenna

.

(2)

6.3

Define

each of
the following terms with reference to antennae:

6.3.1

Polarisation

6.3.2

I

sotrope

(2×2)

(4)

6.4

A radar installation is used to detect a 9 m

2

target at a distance of 100

km.

The

frequency of operation is 3 GHz and both the transmitter and receiver
antennas have a gain of 20 each.

T

o detect the target successfully, a
minimum power of $1,8 \times 10$

-

18

W

is needed. There is however an attenuation
of 0,002 dB/km.

Determine the m

inimum tra

nsmitter power required to detect this targe

PRIL
EXAMINATION
NATIONAL CERTIFICATE
ENGINEERING PHYSICS N6

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This question paper consists of

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pages and a formula sheet

of 2 pages

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REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

ENGINEERING PHYSICS N6

TIME: 3 HOURS

MARKS: 100

INSTRUCTIONS AND INFORMATION

1.

2.

3.

- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

Answer ALL the questions

· Read ALL the questions carefully.

Number the answers according to the numbering system used in this question paper.

Keep subsections of questions together

· All calculations should consist of at least the

THREE steps:

5.1

The formula used or the manipulation thereof

5.2

S

ubstitution of the given data in the formula

5.3

The a

ns

wer with the correct SI unit

The constant values, as they appear on the attachment information sheet, must be used where ever possible.

Use $g = 9,8 \text{ m/s}^2$

2

Drawing instruments must be used for all d

rawings/diagrams. All

drawings/diagram

s

must be fully labelled.

Answers must be rounded off to THREE decimal places.

Rule off on completion of each

q

uestion

· Write neatly and legibly.

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QUESTION 1: SOUND

1.1

Explain what you understand with the following concept

s

as applicable to standing waves

:

'node' and 'antinodes'

(2)

1.2

What are

the

distances between a displacement node and displacement antinodes as applicable to a standing wave?

(1)

1.3

Determine the longest

-

and short

e

st length of a church organ

pipe, which are

open at both ends,

of

which the frequency is between 68 to 2095 Hz.

The speed of sound in air is 345 m/s

(3)

1.4

Briefly explain what is meant by 'The Doppler Effect' in the engineering physics environment.

nt.

(2)

1.5

A car horn is sounded for a pedestrian crossing a road

. T

he frequency of the

horn is 850 Hz. The speed of sound in air is 345 m/s.

Determine the following:

1.5.1

The frequency heard by the pedestrian, standing at the crossing,
while the car is approaching him
/her
at a speed of 55 km/h.

1.5.2

The frequency heard by the pedestrian when the car is just passing
him/her

.

1.5.3

The frequency heard by the pedestrian if he
/she
runs after the car
at a speed of 6 m/s.

(3

×

2)

(6)

1.6

A test was conducted in
a
laboratory
on a Kundt dust

-

tube

. A

n

alumin

i

um rod

with a length of 0,7 m and which was clamped at its mid

-

point, is set into

longitudinal oscillation. The distance between the dusts heaps in the tube
is

85 mm.

Determin

e the following

i

f the speed of sound in air is 345 m/s:

1.6.1

The velocity of sound in the rod

1.6.2

The frequency of the note emitted by the rod

(2

×

2)

(4)

1.7

A captain standing on an anchored boat observed that the boat has risen and fall through a total range of 2,5 meters once every 4 seconds as waves with crests that are 32 meters apart pass by.

Determine the following:

1.7.1

The frequency of the waves

(1)

1.7.2

The velocity of the waves

(2)

1.7.3

The amplitude of the waves

(1)

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1.8

A piano player attaches

the

piano string to one end of a tuning fork and

it

is

vibrating with a frequency of 260 Hz. The length of the string is 80 cm and its

mass

is

120 grams.

Determine the following:

1.8.1

The wavelength

s
e
v
a
w
y
r
a
n
o
i
t
a
t
s
e
h
t
f
o
 λ

1.8.2

The velocity v of the stationary waves

1.8.3

The tension applied to the string that will cause it to vibrate in 4 segments

(3

×

2)

(6)

[28]

QUESTION 2:

THERMODYNAMICS AND STEAM

2

.1

Explain the difference between an isothermal change and an adiabatic change of a gas.

(2)

2.2

Define the second law of thermodynamics.

(3)

2.3

Kevin power station develop

s

600 MW of power with 35% efficiency. The exhaust heat

is exposed into

a river
with an average outlet flow of
35 kg/s. Use
: T
he specific capacit
y of water = $4,187 \times 10^3 \text{ J/kg.K}$
Calculate the temperature increase of the water.
(5)

2.4
What is the relation between the efficiency of a Carnot cycle and the
maximum and minimum temperature of the process?
(2)

2.5
A Carnot engine function
s
between 20°C
and
 90°C . What is
the
efficiency of
this engine?
(2)

2.6
Explain what is meant by the triple point of a substance.
(2)

2.7
One
-
and
-
a
-
half
f
kilogram of a gas with an initial temperature of 23°C and a
pressure of 180 kPa is compressed adiabatically to a pressure of 1 200
kPa.

Use
:
Cp as 8
61 J/kg $^\circ\text{C}$ and Cv as 615 J/kg $^\circ\text{C}$
Calculate the work done during the compression.
(6)

2.8
Du
ring an experiment the following data was used
.
I

ice cubes with a
temperature of

-
8

°C and a total mass of 55 grams are placed in a
330 gram cup of tea at 82 °C. Use the heat capacity of tea as the same as
water and determine the final equilibrium
temperature of the substance.

Use the following data in the calculation

: T

the specific latent heat of fusion of

ice is equal to

333 kJ/kg and the specific heat capacity of ice is equal to

2,089 kJ/kg.K

(8)

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QUESTION 3:

ELECTROSTATICS

3.1

Calculate the electric field strength in air midway between two point
charges

of $+20 \times 10$

-

8

C and

-

5×10

-

8

C separated by a distance of 10 cm.

Hint: using k as 9×10

9

Nm

2

/C

2

(3)

3.2

A parallel

-

plate capacitor is made with seven metal plates and separated by sheets of mica having a thickness of 0,3 mm and a relative permittivity of 6.

The area one side of each plate is 500 cm

2

.

Calculate the capacitance in microfarads. Using the permittivity of free space

as $8,85 \times 10$

-

12

F/m.

(3)

3.3

Determine the energy stored in the capacitor when a 1,2 μf television set capacitor is subjected to a 3 000 V potential difference across its terminals.

(3)

3.4

A gate motor battery of 12 volt

is charged at a rate of 15 coulomb per second.

Calculate the following:

3.4.1

The amount of power needed to charge the battery.

3.4.2

The amount of energy that is stored in the battery if it is charged for one hour

(2

x

3)

(6)

[15]

QUE

STION 4:

ATOM PHYSICS

4.1

A hydrogen atom consists of a proton (charge $+e$) and an electron (charge

-

e)

that are $5,3 \times 10$

-

11

m apart.

Calculate the attractive force between them.

(2)

4.2

The photoelectric effect

-

light directed at the surface of certain metals cause electrons to be emitted. In the case of potassium, 2 eV of work must be done to remove an electron from the surface.

Calculate the following:

4.2.1

If light of wavelength 5×10^{-7}

-

7

m falls on a potassium surface, calculate the maximum energy of the photoelectrons that emerge.

4.2.2

If light of wavelength 4×10^{-7}

-

7

m falls on the same surface, calculate whether the photoelectrons will have more or less energy

.

U

se

:

1 eV as $1,6 \times 10^{-19}$

-

19

Joule

Take: $e = 1,6 \times 10^{-19}$

-

19

C and Planck's

constant = $6,63 \times 10^{-34}$

-

34

J.s

(2

×

2)

(4)

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-

stopped or absorbed by a thin
aluminium
sheet of
0,002 cm.

This
radiation he called

...

.

4.5.5

Rutherford also found that another particle required a few
millimetres of aluminium to be stopped or ab
sorbed. This radiation
he called ...

.

(5

×

1)

(5)

4.6

When a metal is heated, electrons are ejected.

4.6.1

What name is given to this phenomenon?

(1)

4.6.2

Briefly explain why electrons are ejected.

(2)

4.6.3

Explain why ejected

electrons would return to the hot metal.

(2)

4.7

What is the relationship between the energy of a photon and its
frequency?

(2)

4.8

What is meant by threshold frequency when referring to the photo elect

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NOVEMBER

EXAMINATION

NATIONAL CERTIFICATE

INDUSTRIAL ELECTRONICS N6

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November 2016

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and a formula sheet of 3 pages

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INDUSTRIAL ELECTRONICS N6

TIME: 3 HOURS

MARKS: 100

INSTRUCTIONS AND INFORMATION

1.

2.

3.

4.

Answer ALL the questions.

Read ALL the questions carefully.

Number the answers accordi

ng to the numbering system used in this question
paper.

Write neatly and legibly.

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QUESTION 1

: TRANSIENTS

1.1 The following components are assembled for an experiment on current decay in an R

-

LC circuit.

•

A variable resistance of unknown value

•

A capacitor of 22,75 μF

•

An inductor of 32,25 mH

If critical damping is employed for this experiment, calculate the value of the

natural frequency (f_n) of oscillation of the wave train that would be produced

on the display of t

he test instrument used for this experiment.

(10)

1.2

Name

the other

TWO

damping methods that could also be used to conduct the experiment in QUESTION 1.1 above.

(2)

[12]

QUESTION

2: TRANSDUCERS

2.1

Give

the standard current range values tha

t must be used for signal

conditioning.

(1)

2.2

In a face brick manufacturing factory, the temperature of a thermally insulated

chamber ranges from 155 °C to 555 °C.

A thermocouple which measures

1,
55 mV per 10 °C on the output of an Op

-
Amp multiplie
r circuit is used to
interface with a standard signal range of 1 V to 5 V
for a metering resistor
value 1,
55 KΩ.

Calculate the value of the suitable feedback resistor that is connected to
the
Op

-
Amp

.
(9)
[10]

QUESTION

3: ULTRASONICS, X

-
RAYS
AND RADIO ACTIVITY

3.1
Ultrasonic energy is generated through waves that have short
wavelengths.

State
TWO characteristic features of ultrasonic energy as a result of the short
wavelengths.

(2)
3.2
When employing ultrasonic machining processes to ma
chine hard and brittle
materials, it is the cutting fluid and not the cutting tool that does the
actual
cutting.

3.2.1
Give another name for the cutting fluid that is used for ultrasonic
machining process.

(1)
3.2.2
State FOUR functions of the c
utting fluid used during the ultrasonic
machining process.

(4)
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3.3

State the main advantage for not generating external heat when employing

ultrasonic welding techniques.

(1)

3.4

A photomultiplier tube has a cathode sensitivity of 45 μA per lumen and

consists of 6 stages each with an emission factor of 7.

If the maximum safe

output current may not exceed 5,5 mA, then

Calculate the following:

3.4.1

The amplification

(2)

3.4.2

The tube sensitivity

(2)

3.4.3

The maximum safe illumination

(3)

3.5

Name

the THREE factors that determine the sensitivity of a photomultiplier.

(3)

[18]

QUESTION

4: AUTOMATIC INSPECTION, TESTING AND NDT

4.1

Inspection of articles forms an integral part in any manufacturing process.

4.

1.1

Give

ONE

main reason for the need to carry out the inspection process on manufactured articles.

(1)

4.1.2

Name the TWO groups into which inspection, testing, sorting and grading devices are divided

.
(2)

4.1.3

Di

stinguish

, in terms of yield

d results, between the TWO

inspections systems in QUESTION 4.1.2 above.

(4)

4.2

Non

-

Destructive T

esting is a method used for testing items for defects which

are not visible to the human eye. This can be achieved through the use of

X

-

r

ay tubes.

Name

the THREE methods commonly used for

N

on

-

D

estructive

T

esting

t

hrough the use of

X

-

ray tubes.

(3)

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QUESTION

5: ELECTRONIC SAFETY DEVICES AND ELECTRONIC POWER CONTROL

5.1

In industry, safe operation of machines is dependent upon acute designs and connections of electronic safety devices to the industrial machine. Distinguish, with respect to connection techniques, THREE main differences between positive protection and negative protection.

(3)

×

2)

(6)

5.2

Briefly define the term intrinsic safety, as applicable to the workplace safety environment.

(3)

5.3

Closed

-

1

loop control systems are divided into two main groups. Name and describe the TWO groups into which closed

-

loop control systems are divided.

(4)

5.4

The development of a CAD system can be broken down into a number of development stages.

Draw a labelled

1

block diagram to show these stages.

(6)

[19]

QUESTION

6:

THYRISTOR DEVICES AND SCR SPEED CONTROL

6.1

A simple thyristor half

-

w

ave rectifier circuit which uses an SCR and a resistive load, operates on the following data:

•

V

SUPPLY

= 240 V RMS

•

R

L

= unknown value

•

Thyristor (SCR) Current = 15 A

Calculate the following:

6.1.1

The mean load voltage for 0

◦

and 90

◦

(3

×

2)

(6)

6.1.2

The maximum thyristor voltage

(2)

6.1.3

The RMS value of the current flowing through the thyristor.

(2)

6.2

State SIX advantages of direct

-

current motor

-

speed control.

(6)

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-

6

-

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QUESTION

7:

PROGRAMMABLE LOGIC CONTROLLERS

7.1

A

typical PLC consists of three basic sections, namely, a programmer, a programmable controller and an expansion unit.

Draw

a complete, fully labeled block diagram of a programmable controller unit of a PLC.

(7)

7.2

Define the following terms as used in the study of PLC's:

7.2

.1

E

dit

7.2

.2

E

lement

7.2

.3

R

ung

7.2

.4

T

imer

(4

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1)

(4)

7.3

Draw a labeled ladder diagram of a NAND function using two input contacts.

(4)

[15]

TOTAL

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: Pierre de
Villiers
Tel: 012
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5545
/ 082
697 0982
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mail:
devilliers.p@dhet.gov.za

TECHNICAL AND VOCATIONAL
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COLLEGE ACADEMIC
CALENDAR FOR 202
2
NATIONAL CERTIFICATE
VOCATIONAL (NCV)
ANNUAL
STAFF
COMMENCES
CLASSES
COMMENCE
CLASSES END
EXAM DATE
COLLEGES CLOSE

LECTURING DAYS	October
LECTURING	Life Skills & Computer Literacy
STAFF	(
S	P2
ERVICE)
DAYS	:
Term 1	24
17	-
January	2
24	8
January	October
01 April	Examination:
Supplementary Examination	31
:	October
21 February	-
-	30
1	November
6	0
March	2
01 April	December
49	2
54	5
Term 2	5
11 April	0
11 April	YEAR TOTALS
15 June	:
15 June	1
4	70
4	20
4	1
4	REPORT 191:
Term 3	BUSINESS AND UTILITY
04 July	STUDIES
04 July	SEMESTER
16 September	STAFF
14 Days for the Internal	COMMENCES
Examinations	CLASSES
16 September	COMMENCE
53	CLASSES END
53	EXAM DATE
Term 4	COLLEGES CLOSE
2	LECTURING DAYS
6	LECTURING
September	STAFF SERVICE
2	DAYS
6	Semester 1 Term 1
September	1
2	7
8	January

2	4
4	8
January	53
01 April	Semester 2 Term 4
01 April	2
49	6
54	September
Semester 1 Term 2	2
1	6
1	September
April	0
1	7
1	November
April	Computer
2	Related Subjects
0	:
May	01
Computer	-
Related Subjects	07 November
:	Examination:
17	0
-	8
23 May	Nov
Examination:	ember
2	-
4	30 November
May	0
-	2 December
1	31
5	5
June	0
1	YEAR TOTALS
5	:
June	15
26	4
4	20
4	1
Semester 2 Term 3	REPORT 191: NATURAL
04	SCIENCE STUDIES
July	TVET LETTERED
1	CIRCULAR NM
1	(Dated 27 July 2021)
July	STAFF
1	COMMENCES
6	CLASSES
September	COMMENCE
1	CLASSES END
6	EXAM DATE
September	COLLEGES CLOSE

LECTURING DAYS
LECTURING
STAFF SERVICE
DAYS
2021 T3 Candidates
Prep,
Revision and
Examinations
1
7
January
17
January
28 January
31 January
-
18 February
18 February
1
0
25
Trimester
1
28 February
1
6
March
24
June
27
June
-
15
July
15
July
6
6
93
Trimester
2
10
August
15
August
11
November
14
November

-
02 December
02 December
6
5
83
YEAR TOTALS
:
14
1
201
NOTES
PUBLIC AND COLLEGE
HOLIDAYS
1 JANUARY
NEW YEAR'S DAY
The Calendar was set taking
cognisance of the late
release of results in Engineering
Study.
The
I
nternal
E
xaminations may be conducted
either in the second or third
term, for a maximum of fourteen
days
for NC (V) candidates
.
21 MARCH
HUMAN RIGHTS DAY
15
APRIL
GOOD FRIDAY
18
APRIL
FAMILY DAY
Lecturing staff service days when
no students are on campus MUST
be utilised for lesson planning,
assessment planning, subject
s and
faculty meetings, lecturer
training, work integrated
learning and work
-
based experience, and
administrative work.

27 APRIL
F
REEDOM DAY
1 MAY
WORKERS' DAY
The NC (V)
Supplementary
E
aminations should not impede
teaching contact time
2
MAY
PUBLIC HOLIDAY
16 JUNE
YOUTH DAY
1
7
JUNE
COLLEGE HOLIDAY
08 AUGUST
COLLEGE HOLIDAY
9 AUGUST
NATIONAL WOMEN'S DAY
No deviation
from this approved calendar is
allowed without prior approval by
the Director
-
General of the Department of
Higher
Education and Training.
24 SEPTEMBER
HERITAGE DAY
16 DECEMBER
DAY OF RECONCILIATION
25 DECEMBER
CHRISTMAS DAY
26
DECEMBER
DAY OF GOODWILL
DR PHIL MJWARA
ACTING
DIRECTOR
-
GENERAL: HIGHER EDUCATION
AND TRAINING
DATE:
27 SEPTEMBER 2021

vet Colleges School Calendar 2022

Tvet Colleges School Calendar 2022

In South Africa, there are fifty registered and certified public TVET colleges operating on 364 campuses across the country's rural and metropolitan areas. The Continuing Education and Training Act 16 of 2006 authorizes the establishment and operation of public TVET colleges, which are administered by the Department of Higher Education and Training.

The acronym for (Tvet) is Technical Vocational Education and Training. Tvet is a term used in international education to express the growth of individual abilities and businesses. A Tvet college is also the greatest alternative for you if you want to establish your own business or learn new practical skills. Tvet Colleges are frequently focused on educating students to work as functional workers in their skilled trade of choice.

Agriculture, arts and culture, business, hospitality, commerce and management, education, training and development, engineering, manufacturing and technology, services, building construction, and security are among areas where TVET Colleges can provide courses. Tvet Colleges School Calendar 2022

**Tvet Colleges application open
date:**

The Technical and Vocational Education and Training (TVET) Colleges Online Application for 2022 opens on 1 September and closes on 30 November. Therefore, all those who want to apply for TVET College Online should do so before the application deadline.

Read: [lecturer vacancies tvet colleges](#)

Tvet colleges application documents needed to apply:

The following documents must be submitted due to applying to the college:

A unique/valid Email address and cellphone number
3 certified copies of ID of Parent/Legal Guardian
3 certified copies of ID of Learner
South African applicants will need an ID number.
Foreign applicants will need their certified copies of passport numbers.
Copy of your school qualifications (eg Senior Certificate)
A certified copy of your latest results/Grade 9 or Higher;
Proof of Residence.
SAQA approved foreign qualifications
Proof of medical insurance or cover
Valid study permit

Tvet Colleges School Calendar 2022

How to Make an Application

Get your application form first.

All new applications are now available online:

I consent to the TVET College using my e-mail address and cellphone number to communicate with me throughout the application process. During the application process, please make sure you include a valid and working e-mail address as well as one telephone number.

Step 2: Fill out the application form completely.

E-mail, ID, and cell phone number verification. Your ID, e-mail, and cell phone are used to verify your identity.

Step 3: Ensure that all supporting documents are attached.

All applicants who are beginning a new qualification must submit the following certified documents:

Birth Certificate/Identity Document (Proof of New ID/Passport Application)
Certificates/Qualifications
Recent Academic Achievements
Other account statements/billing documents for municipalities (not older than 3 months)
a current study permit (Foreign national students)
The Evaluation Certificate of the South African Qualification Authority (SAQA) (foreign qualifications).

Step 4: Fill out and submit your application.

You will receive a confirmation email containing all application details.

TVET Colleges Schools Calendar for 2022

National Certificate Vocational (NCV)
Term 1 (L2)

Term 1 consists of 48 lecturing days.

Classes start 25 January
Classes end 1 April
Supplementary Examinations 10 March - 1 April
College closes 1 April

Term 1 (L3 & L4)

Term 1 consists of 38 lecturing days.

Classes start 8 February
Classes end 1 April
Supplementary Examinations 10 March - 1 April
College closes 1 April

Term 2 (L2, L3 & L4)

Term 2 consists of 44 lecturing days.

Classes start 12 April
Classes end 14 June
College closes 14 June

Term 3 (L2, L3 & L4)

Term 3 consists of 51 lecturing days. There are also 14 days for internal examinations.

Classes start 8 July
Classes end 17 September
College closes 17 September

Term 4 (L2, L3 & L4)

Term 4 consists of 23 lecturing days.

Classes start 27 September
Classes end 27 October
Exam Dates 28 October - 26 November
Life Skills & Computer Literacy (P2) 21 - 27 October

College closes 8 October

Report 191: Business And Utility Studies

Semester 1 Term 1

Semester 1 Term 1 consists of 48 lecturing days.

Classes start 25 January
Classes end 1 April
College closes 1 April

Semester 1 Term 2

Semester 1 Term 2 consists of 28 lecturing days.

Classes start 12 April
Classes end 21 May
Exam Dates 24 May - 14 June
College closes 14 June

Semester 2 Term 3

Semester 2 Term 3 consists of 47 lecturing days.

Classes start 14 July
Classes end 17 September
College closes 17 September

Semester 2 Term 4

Semester 2 Term 4 consists of 30 lecturing days.

Classes start 27 September
Classes end 8 November
Exam Dates 9 November – 30 November
College closes 8 December

Report 191: Natural Science Studies

Trimester 1 (N1, N5, N6)

Trimester 1 (N1, N5, N6) consists of 47 lecturing days.

Classes start 25 January
Classes end 31 March
Exam Dates 1 April – 23 April
College closes 23 April

Trimester 1 (N2, N3, N4)

Trimester 1 (N2, N3, N4) consists of 37 lecturing days.

Classes start 8 February
Classes end 31 March
Exam Dates 1 April – 23 April
College closes 23 April

Trimester 2

Trimester 2 consists of 45 lecturing days.

Classes start 20 May
Classes end 22 July
Exam Dates 23 July – 13 August
College closes 13 August

Trimester 3

Trimester 3 consists of 47 lecturing days.

Classes start 8 September
Classes end 12 November
Exam Dates 15 November – 3 December
College closes 8 December

The Internal Examinations

may be conducted either in the second or third term, for a maximum of fourteen days for NC(V).

it. SAQA reserves the right to change this advice should new authoritative information come to its attention.

Our online application document stipulates the following in terms of schooling qualifications:

"SAQA accepts only school leaving qualifications issued by the official examining / certification body in the country of origin, and not by the school, where based on external examinations."

No Certificates of Evaluation will be issued for school leaving documents other than those in respect of completed, national school exit qualifications issued by the relevant authorities."

Therefore, only school leaving qualifications correctly awarded by the authorised national examination body in the Democratic Republic of Congo will be recognised and not school leaving documents issued by the school itself.

Please note the purpose of this overseas institutions email is to give people some direction regarding accredited and non-accredited foreign institutions for the purpose of recognition and acceptance by SAQA for foreign qualifications evaluation.

Kind regards

Authentication Services

SAQA

The National Qualifications Framework (NQF) Act 67 of 2008 mandates SAQA to provide a foreign qualifications evaluation and advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

From: tshingombe <tshingombekb@gmail.com> **On Behalf Of** tshingombe
Sent: Friday, 08 July 2022 14:54

To: foreigninstitutions <foreigninstitutions@saqa.co.za>
Subject: Foreign institutions inquiries: #6594

Name: tshingombe
Country: [South Africa](#)
Purpose: [Check status before applying for evaluation](#)
Email: tshingombekb@gmail.com
Institution: Saqa instituts St peace college Africa
institute police .. tshingombe
Institution physical address: CNR chruits strut marketer house ..jhb
carton center
Website: tshingombekb@gmail.com
Comment: Hello dear submitted for examination
award degree diplomat final completed
bulletin certificate RSA dr Congo student
apply dhet examination was irregularities
kgaka for reasoning saqa no meet award
final Rd Congo n6n5n6.educare and
engineering electrical technical ..
education technical . pedagogy
technical.. science math info



Foreign Institutions Sun, Jul 10, 12:25 PM

Thank you. SAQA has received your enquiry and will respond to it within two working days, unless further research and/or consultation is required.
Your Referenc



TSHINGOMBEKB Tue, Jul 12, 9:54 AM
TSHITADI<tshingombekb@gmail.com>

Email from SAQA

Inbox



SAQA

<noreply@saqa.co.za>

Oct 12, 2021, 10:29 AM (5 days ago)

to
TSHINGOMBE52
0

Dear FISTON TSHINGOMBE TSHITADI,

APPLICATION FOR THE EVALUATION OF FOREIGN QUALIFICATIONS

The application for the evaluation of the foreign qualifications of the above-mentioned does not meet all SAQA's requirements stipulated in the application material

Below is what is outstanding on the application:

- An application form / invoice generated from the online application system, which bears a signature and date.
- Proof of payment of the amount reflected on the system generated application form / invoice, which bears the online submission number as reference.
- A consent form signed by the above-mentioned qualification holder.
- Valid proof of identification of the above-mentioned qualification holder.
- Final award certificate(s)
- Academic transcript(s)

NB: Please log into your SAQA online profile and upload all the outstanding documents together with the documents that were previously submitted (Complete application pack) DO NOT SEND THESE VIA E-MAIL.

Kindly note that this should be completed within 48hrs.

Yours sincerely

Authentication and Ratification Services

South African Qualifications Authority: Disclaimer and Confidentiality Note. This email, its attachments and any rights attaching hereto are, unless the context clearly indicates otherwise, the property of South African Qualifications Authority. It is confidential, private and intended for the addressee only. Should you not be the addressee and receive this email by

mistake, kindly notify the sender, and delete this email immediately and do not disclose or use same in any manner whatsoever. Views and opinions expressed in this email are those of the sender unless clearly stated as those of South African Qualifications Authority. South African Qualifications Authority accepts no liability whatsoever for any loss or damages whatsoever and howsoever incurred, or suffered, resulting, or arising, from the use of this email or its attachments. South African Qualifications Authority does not warrant the integrity of this email nor that it is free of errors, viruses, interception or interference

RESULT EXAM DATABASEInbo

fiston

tshingom

be

Forwarded message -----

From: fiston tshingombe <tshingombe520@gmail.com>

To: infostpeacecollege@gmail.com, study@stpeacecollege.com,
"DFQEAS@SAQA.org.za" <dfqeas@saqa.org.za>, Sci-Bono Discovery
Centre <cynthia.mohohlo@sci-bono.co.za>, "Techniques de l'Ingénieur"
<retour@teching.com>, heuer@saps.gov.za, h.dlamini@unesco.co.za,
Hope Mohammed <HMohammed@sasseta.org.za>, Sasseta AGM
<AGM@sasseta.org.za>, sassetacommunications@sasseta.org.za,
careerhelp@dhnet.gov.za, callcentre@dbe.gov.za, callcentre@dhnet.gov.za,
certification@dbe.gov.za, qcto@tip-offs.com, queries@drdlr.gov.za,
uifcomplaints@labour.gov.za, Contact Us <contactus@sars.gov.za>,
sapsweb@sita.co.za, assessment@qcto.org.za, accreditation@qcto.org.za,
foreignapplications@saqa.org.za, Governor@resbank.co.za

Cc:

Bcc:

Date: Thu, 7 Oct 2021 16:54:28 +0200This message was created
automatically by mail delivery software.

A message that you sent could not be delivered to one or more of its
recipients. This is a permanent error. The following address(es) failed:

heuer@saps.gov.za

host mx1.saps.gov.za [164.151.129.207]

SMTP error from remote mail server after pipelined MAIL

FROM:<tshingombe520@gmail.com> SIZE=12717011:

552 5.3.4 message size limit exceeded at MAIL FROM

St Peace College:



Author submission tshingombe tshitadi: student

Learner teacher and educatory activity: kekele moloi , conies

1. TOPIC: ORAL PRESENTATION. Assessment test

1.2 INTRODUCTION: LEARNING ENGINEERING ELECTRICAL THING ABOUT

Professional and council engineering ruling and council education trading and training school high grade qualification trading and training school , high grade qualification saqa degree , plume between countries developing and agreeing buy consentient association and commissioner international.

-typical , unesco unique, un ,fmi , eic , cebec , sabs , saqa , epsp , esu , organization rational, interne country and international , country committed congregation sadc, country agree ,, and according a framework , and support, communality for , transcript and translate , letter exchange subject , for academique and school , training equivalent , founding a protocol legal phase service council cooperation international and inter regional to work and studied visa in phase country sadc including rsa parternaria t and studied visa in those country sad including rsa partenariat and studied visa rsa drc , embassy , to make verification documentation educational rsa , drc portfolio and planning educational in English Africans and French dr congo diplomatic,

-following in the time and actualize learning mr tshingombe tshitadi , interview and phase , high school school my research an saqa

framework and time table , allocation involve electrical engineering following education technical , engineering time table , support framework compliance and condition ,

-study subject assessment saqa award degree diploma, that is not meet framework saqa for, criterion test saqa supplementary

- course teacher give to student engineering practice over time table over subject no including documentation language in rsa system , educational councilor ,

- my integration in college education high graduation diploma engineering to achieve mark , score record , transcript and certify copyright reward , award , statement compelling are true and achieve the verification agree saqa and council the time table presented , in the high grade degree diploma record sale and pricing award , reward extra subject criterion outcome , exhibited screed , saqa development college vocational , technical learning distance career professional , policy saqa term award for, 1th and continuing college 2th phase over 3 month no examination and certificate department .

Topic, business.	Mark	Remark
Oral presentation		
Confidence	5 mark	-5mark
Eye contract	5 mark	
movements	5mark	
Topic	5 mark	
Grammar punctual	5 mark	
Functioned pronoun		
Total mark	25 mark	

-

2. TOPIC. LEARNING ENGINEERING TIME TABLE ASSESSEMENT

DESIGN TABLE ALLOCATION MARK: mark saqa module award degree diploma engineering electrical time

- Abstral :Development project curriculum vitae presentations project art work , superior quality polytechnic professional service

education award degree council creating value for monetary file
pocket document wallet

- -read :book engineering electrical trade textbook rearward
homework class work , framework student and daily learning ,
superior quality
- Prepare and oral : resume and practice assessment give oral
award degree diplomat meet requesting saqa coition engineering
module completed discovering language extra subject in rsa .
allocation math , science engineering , industrial electronic, trade
theory electrical, , engineering electrical outcome ,criterion exhibit
module semester learning reward workbook, presented saqa.
- Enforcement: low experience engineering command , saps saqa
policing requesting low educational council saqa
- Exam : find experience engineering course by topic course
number , accreditation award minimum criterion
- 2 collection :audio video lecture , on line textbook , news course
not visited course , supplement air resource , cross disciplinary
- Topic list energy , entry engineering learning electrical outcome
award

-translated course education award degree diplomat certificate test
evaluation dr Congo examination high grade institution pedagogy
technical examine and test attestation preparatory high grade
diploma subject science technical pedagogy , math chemistry physic
technology mechanical electrical design technical drawing electrical
, examination evaluation unkin, training formative subject module
initiation informatique mathematique laboratory , module treatment
text and table , access data base ms dos ms windows ,ms world ,ms
excel, certificate recognize result university of Kinshasa faculty
science department math info outcome criterion saqa award degree
diploma un training unresponsive meet requirement undergraduate
training information pc math , inpp formative training rdc jury oral
practice training test testament attest service motoring training
preparatory pre – course subject motoring petrol initiation service
level or a1,a2,a3, training unresponsive saqa , reason basic
advanced filing tvet level professional or distance learning level
certificate career council professional functioning role outcome
labor work public training ccma labour out educational system ,
reasoning does meet requirement enprentship tvet practical council
engineering electrical or social council at , education council
professional close corporation to labour institutional examination no
to educational department accreditation seta merseta trading council
in education technology . Phase foundation teaching, engineering

level.intermediare. Inpp close minister work social and education dr Congo institutional multi vocational multi discipline.

-about mit open course aware, site state stories media coverage

- make donations why donate – become course champion: tshingombe tshitadi family tutorial parental guarding

- Our supporters other ways to contribute, other ways contribute scie bono center libraries, public free air time .research assessment mentor counseling center.

-modeling and assessment for engineering electrical time : table allocation project , engineering foundation system award degree diploma saqa screeds control submission and st peace control task assessment ,

Modeling and assessment for policy , course home syllabus calendar , reading ,lecture note , assignment , project ,

-the term project student saqa use scientific research model to address policy issue (im) instructor , instructor proof , military course number , level

Level: graduate course description other version related saqa course system education rsa

-course features: lecture note project and examples assignment saqa translate and transcription language control education meeting requesting subject by close cooperation and international sad need to verified the same allocation and topic again fault ,prospectus to be review or overview.

- course description : modeling and assessment for policy explainers how scientific saqa and dr congo research center education informer review policy decision making or inspecting , students will develop an understanding of quantitative modeling , technical to learning and equivalent award in good reason monetary budget compensation u.i.f labour reason case ,trading and interactive , activities the course addresses issues such – as analysis of scientific assessment process, use of integrated assessment model , public perception of quantitative information methodic for dealing with un certainties , and design choices in building policy , relevant model, examples use in this class focus on model , and information use in earth system,

- feature , course work , police news fieds tip video , police body armor , duty gear , fire arms , police software , police uniforms , saqa or st peace college rating topic no granted ,

-police vehicle product duty geor at cops rsa or intelligence service police scientific trt or training police for assessment policy, in school learning student award diplomat price to certify or evaluation over stay of 3 month examination academic transcript saqa, reason labour court or examination educational high degree disclaim reason no fundamental time or credit saqa non attendance examination qualification high education

- popular topic investigation k-12 0r k9 , grade phase officer safety officer shooting patrol issue heroes , saps all policy saqa close cooperation topics ,

- resource new letters , police directory grant job trading , police policies , saqa community training assessment community integrating task assessment or time table allocation,

- in our network , our police one partners ,saps corrections news , fire video local gove ,police booking or meet requirement reasoning saqa fails to agreeing our translate or to be granted certificate 3 month later .

-museum of science making models, exhibit for this a problem sets your will need to visited the saqa,

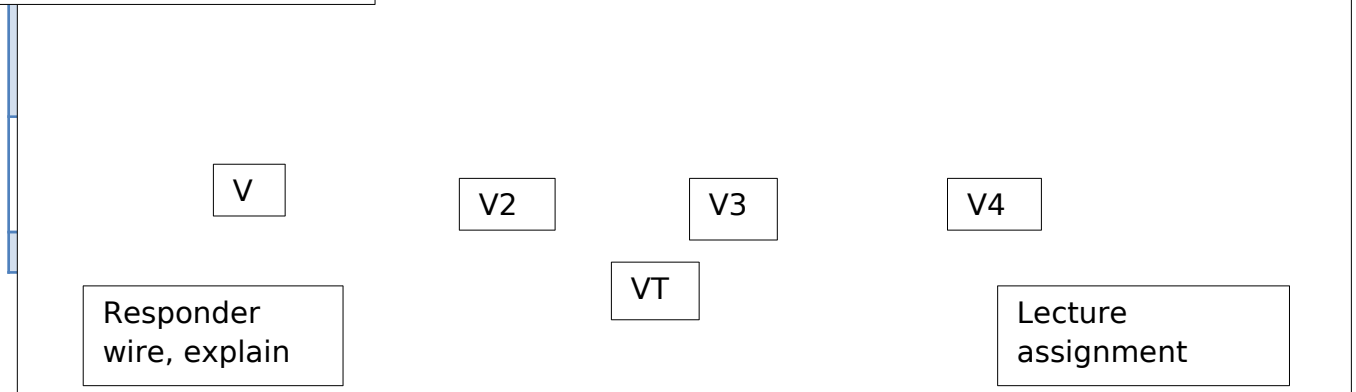
- Model exhibit graduation saqa statement located or criterion after going through. The exhibit. Respond to the following, question

Security Guard Security x 6		
Security Guard Security x 6		
Position: Security Guard Security x 6 Vacancy type: External/Internal		
Task Grade: T05		
Area of Specialization: To protect Eskom's assets and interest by performing physical security duties		
Department: Protective Services		

Topic and activity	material	Daily
Problem set visited saqa	Translate copy and equivalent certificate	

Making model exhibit		
Problem set 2, task assessment models		
-problem set 3: applying framework to case studies		

Applicant wire, explain



Describe overload, interconnection switch, $v_1=220V$, $i=25A$, $v_t + 220$

$$\rho = l \cdot s$$

r

Learning engineering outcome, assignment, policy sabs judgment outcome safety sign, red with green, meter switch judgment in case 250v, compliance 50A explained kwh = responder applicant 250/ 380 argument respondent policy sabs, assessment interlock overload 30v, penalty 25, application dismissed, policy amendment compulsory found factory

explanatory lecture theory trade low describe e explain, design framework time table, mathematical fundamental, topic saqa policy assessment.

-course home, home work classed work subject engineering outcome criterion credit 120 award credit 20 10, 60

-syllabus, textbook trade theory engineering saqa education department not, mark allocation examination saqa n1,n2,n3,n4,n5,n5 1th saqa criterion 50% pass max 120%,

-Calendar, daily saqa 3month examination

- Readings saqa learning textbook extrat note completed subject

Lecture notes, saqa note activity lecture reflexion lecture educator portfolio saqa tvet policy governor, dr Congo syllabus note course ispt Kinshasa, unikin syllabus textbook right reserve assistance ct and

professor dr Congo published university and inpp syllabus note work
publisher editorial table epsp center research pedagogy Manuel

Applicant, safety,
preventive,

pool , saqa arcade teacher note textbook frame work library
and Protection of stress textbook published textbook

Policy patrol coverage
ncv level, inexistence,

Br
ea

Responder
safety prevents

Applicant
preventive safety

What happen VA, vb, qa, qa,
charge discharge?

coverage is granted no certify confusing allocation n1, n4,
under graduate re discovery learning transitional grade

Coverage enclose policy safety portfolio log inspection equipment earth , device , tested regularly , log book
missing covers, base connection ,over load , short circuit protection device, founding earth leave judgment ,
conductor high power reason over power submission,

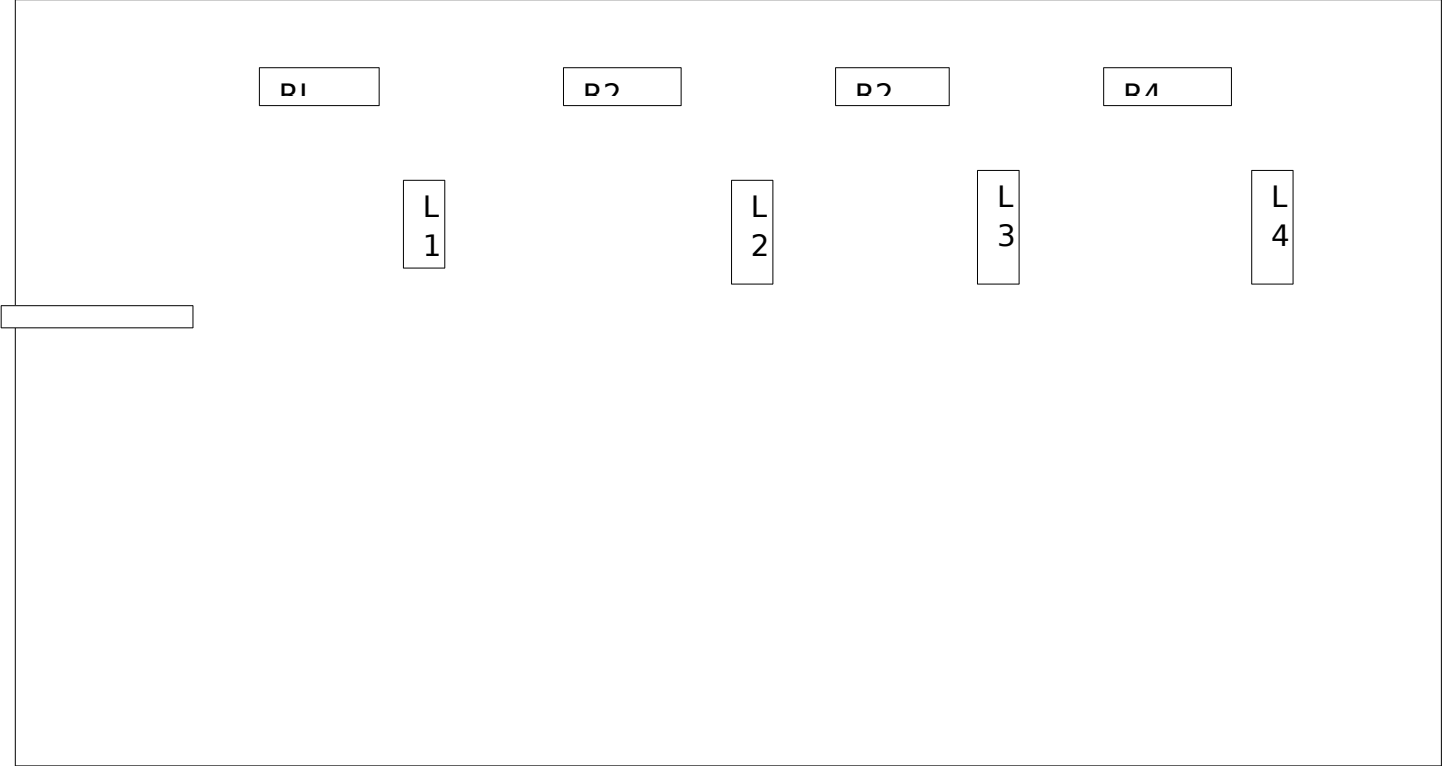
peace policy what makes scientific assessment

$R=?$, $L=500M$, $A=28,27 \times 10^{-6}$, $R=\frac{\rho}{A}=0,0172 \times 10^{-8}$,OHM , $L=1KM$, $1000 M$,
 $A=0,13 \times 10^{-4}$,

RESISTIVITY =0,017 OHM = $0,017 \times 10^{-6}$, $A=\pi \cdot \frac{d^4}{4}=, d=1,5 m, r=, l= 311,8$

3.6. **Frameworks.** Precise warning saqa policy claim disclaimers non
complain subject overview in rsa country,

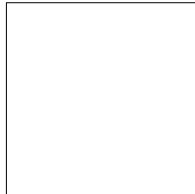
Framework boundaries: no allowed to granted



4.2 protection check point environmental modeling at environmental



- 1. Sentence on research saqa hypothesis or demonstrate unknowldge system award factory low un proof award existence or no existence matter money. Topic interest
- 2. What is problem saqa, epsp, esu, edpt, vs? difference problem college institution lecture or students view science policies assessment portfolio claim award degree diplomat or sans ttt



Coverage enclose policy safety portfolio log inspection equipment earth , device , tested regularly , log book missing covers, base connection ,over load , short circuit protection device, founding earth leave judgment , conductor high power reason over power submission,

- **5.1 TRAINING SCHEDULE - POLICY LOW STATE :**
DELIVERY LEADER IN THE DELIVERRY:

Leader in the of emergency response , offence data recovered
certificate , award degree diplomat or credit course college

Coverage enclose policy safety portfolio log inspection equipment earth , device , tested
regularly , log book missing covers, base connection ,over load , short circuit protection device,
founding earth leave judgment , conductor high power reason over power submission,

-methodology in learning electrical engineering school facilitator saqa
role critical educational curriculum developer under

- Learning engineering electrical saqa process: schedule testing
appointment test taker police makers

Table of contents : topic Activity , current ,direct , alternating current resistance , electronic symbol working with exponents self basement ,		
Electrical trade theory Tommy Ferreira 2020 revised, , analyze correct describe, movement of electron electrodynamics. ,	Education technologies , portfolio education technologies, subject 6, 12, grade	

$$V_T = v_1 + v_2 + v_3$$

$$R_T = r_1 + r_2 + r_3$$

$$\frac{1}{r_t} = \frac{1}{r_1} + \frac{1}{r_2},$$

$$I_t = i_1 + i_2 + i_3$$

$$H = \text{mmf}/e, \text{ mmf} = N \times I, \text{ flux} = B = \frac{\Phi}{A} \frac{W}{m}$$

$a = v - u/t, \dots, a = 147 - 98/15 - 10 = a \text{ 9,8m/s}$, $w = m.g$,, $20 \times 9,8 = 196 \text{ n/m}$, $w = f.s$.. $42 \times 200 = 840$.

$P = 800 \times 50 \times 100 / 60 \times 60 = 11.11$

Efficiency, $ma/dr \times 100\%$, ,

E/serie cndensator= mf + 1/5mf, 1/seri

cserie = 2,142 mf

cfarade = $c_1 + c_2 + c =$ 5mf

=21,

$L_t = l_1 + l_2 + l_3$

= 50mh + 20mh + 15 = 85mh,

$1/l_t = 1/l_1 + 1/l_2 + 1/l_3 =$

= $1/50\text{mh} + 1/20\text{mh} + 1/15$

= $1/l_t = 0,1367\text{mh}$

$L_t = 1/0,1367 = 7,32$,

Peak to peak = $2 \times v_{peAK} = 0,707$,

= 0,637

$T = 1/F$

$V = V_{PEAK} \cdot X \cdot \sin(2\pi f t)$,

-VCC, IC, VCE



<p>it kit mesa, institute superior polytechnic grade 12 equivalent High education metric Course subject, General historical , electrical low , - Specialty , - Principle - Institution technical industrial , - Professional - Mode principle operator preliminaries Professional service, inpp Chapter general ,electrical mechanical trade ,professional Matter scope , definition lesson activity general , Matter , Constitutional , mode employer , Game step , Revision matter ,</p>		
<p>Ispt kin educator, Chapter subject , hypotheses low electrical , thesis ,low Demonstration low analyze Low , educator phenomena , Foundation low factor , demonstration , conduct low enseignant</p>	<p>Educator technology phase Mrseta trading , industrial ,engineering relate, policing engineering correct, defense mil</p>	

Security Guard Security x 6

Security Guard Security x 6

Position: Security Guard Security x 6 **Vacancy type:** External/Internal

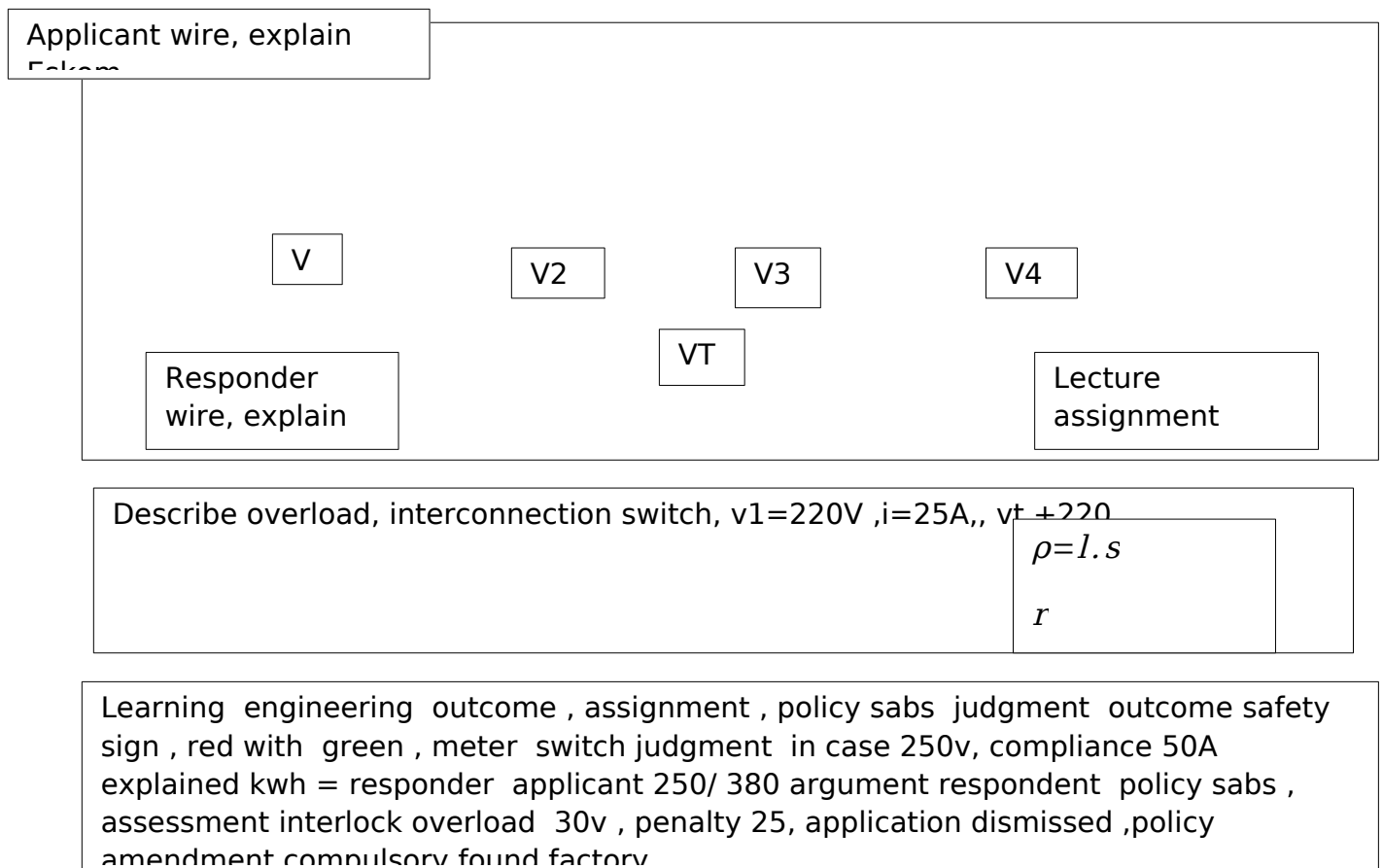
Task Grade: T05

Area of Specialization: To protect Eskom's assets and interest by performing physical security duties

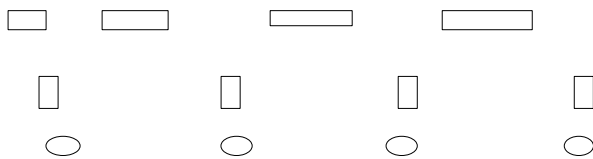
Department: Protective Services

TOPIC 8. Facilitator critical disciplinary

Labor applicant compliance circuit, respondent circuit health



Applicant, safety,
preventive,

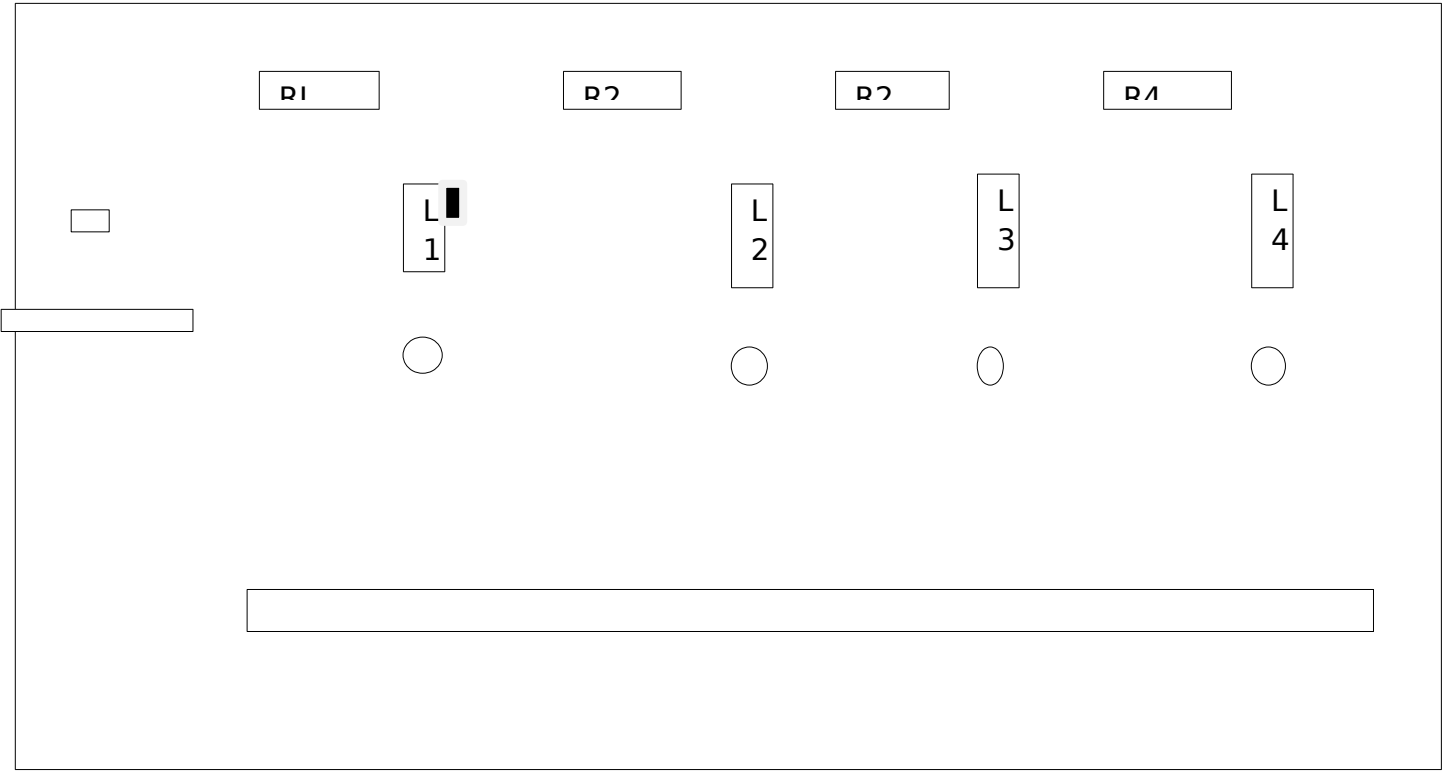


Policy patrol coverage
ncv level, inexistence,

Br
ea

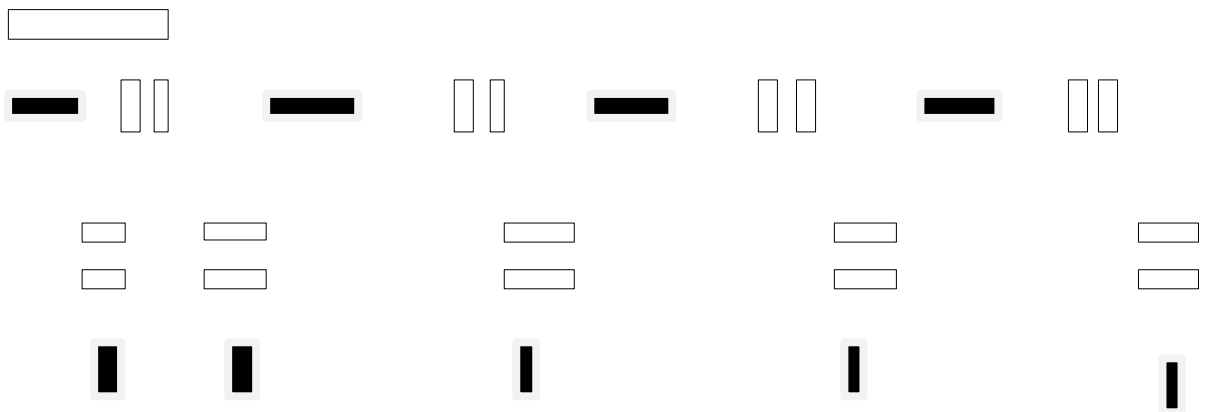
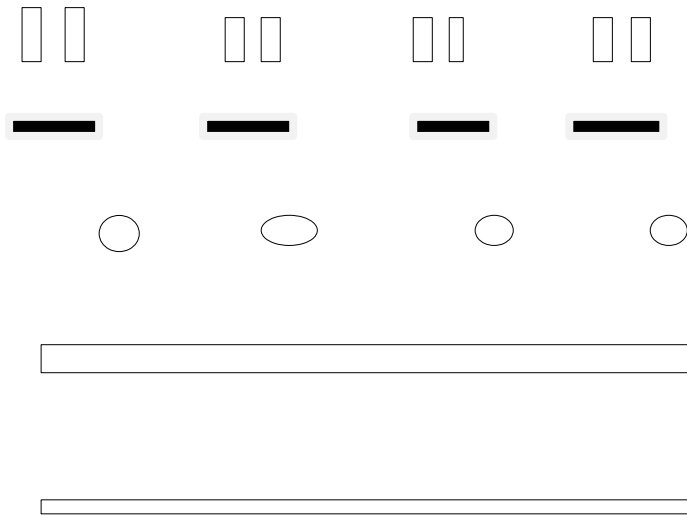
$R=?$, $L=500M$, $A=28,27 \times 10^{-6}$, $R=\frac{\rho}{A}=0,0172 \times 10^{-8}$, OHM , $L=1KM$, $1000 M$,
 $A=0,13 \times 10^{-4}$,

RESISTIVITY = $0,017 \text{ OHM} = 0,017 \times 10^{-6}$, $A=\pi \cdot \frac{d^4}{4} =$, $d=1,5 m$, $r=$, $l= 311,8$





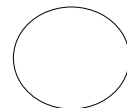
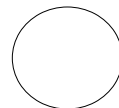
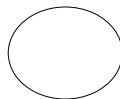
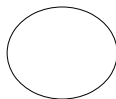
Coverage enclose policy safety portfolio log inspection equipment earth , device , tested regularly , log book missing covers, base connection ,over load , short circuit protection device, founding earth leave judgment , conductor high power reason over power submission,

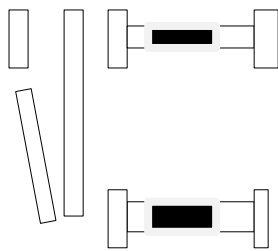
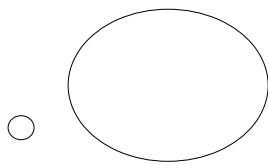


Coverage enclose policy safety portfolio log inspection equipment earth , device , tested regularly , log book missing covers, base connection ,over load , short circuit protection device, founding earth leave judgment , conductor high power reason over power submission,



Coverage enclose policy safety portfolio log inspection equipment earth , device , tested regularly , log
book missing covers, base connection ,over load , short circuit protection device, founding earth leave
judgment , conductor high power reason over power submission,





$$V_T = v_1 + v_2 + v_3$$

$$R_T = r_1 + r_2 + r_3$$

$$\frac{1}{r_t} = \frac{1}{r_1} + \frac{1}{r_2},$$
$$I_t = i_1 + i_2 + i_3$$



$a = v - u/t$,,,,, $a = 147 - 98/15 - 10 = a \ 9,8 \text{ m/s}$, w ,, $20 \times 9,8 = 196 \text{ n/m}$,.... $w = f.s$.. $42 \times 200 = 840$.

$P = 800 \times 50 \times 100 / 60 \times 60 = 11.11$

Efficiency, $\text{ma/drx} \times 100\%$,,,

E/serie cndensator = $1/10 \text{ mf} + 1/6 \text{ mf} + 1/5 \text{ mf}$, 1/serie 0,467,

cser
H = mmf/e , $\text{mmf} = N \times I$, flux = $B = \frac{\mu}{A} \frac{w}{m}$
cfar

=21,

$L_t = l_1 + l_2 + l_3$

= $50 \text{ mh} + 20 \text{ mh} + 15 = 85 \text{ mh}$,

$1/l_t = 1/l_1 + 1/l_2 + 1/l_3 =$

= $1/50 \text{ mh} + 1/20 \text{ mh} + 1/15$

= $1/l_t = 0,1367 \text{ mh}$

$L_t = 1/0,1367 = 7,32$,

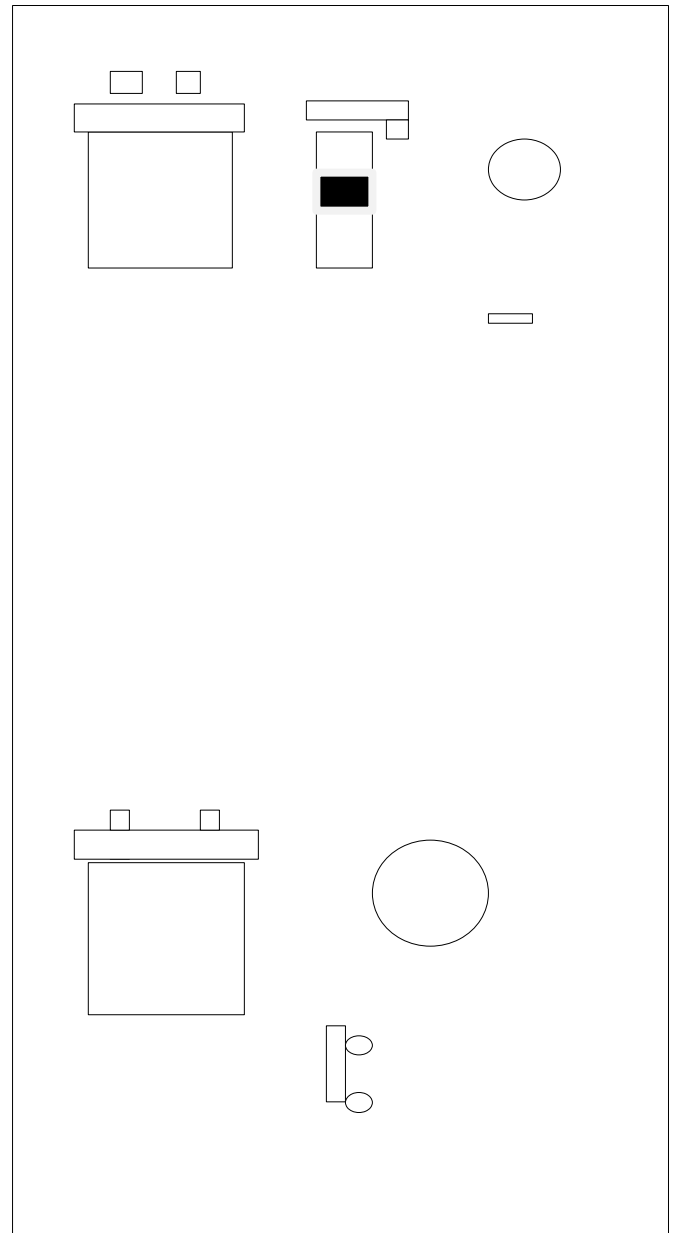
Peak to peak = $2 \times v_{peAK} = 0,707$,

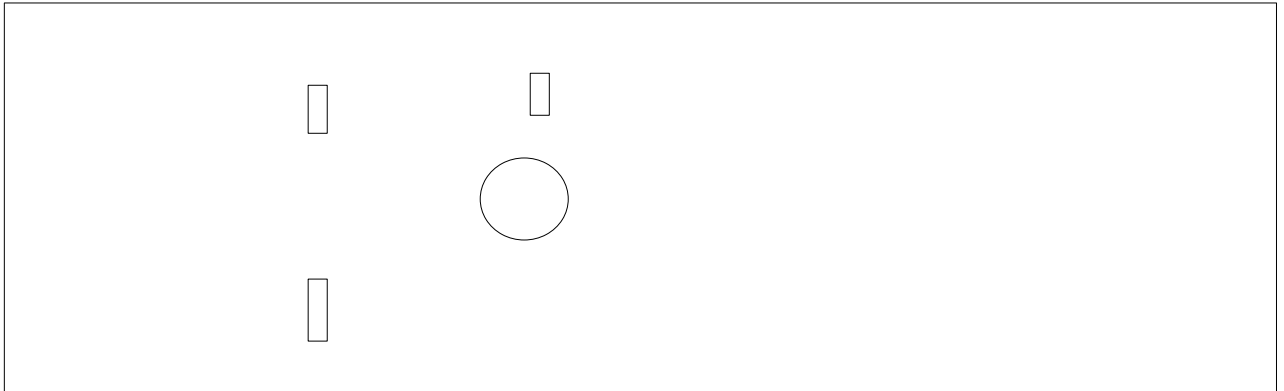
=0,637

$T = 1/F$

$V = V_{PEAK} \cdot X \cdot \sin(2\pi t)$,

-VCC, IC, VCE





TOPIC 9. Training learning, affricate institute policy, assessment, st peace college module semester 70% Practice, 30%theory

-Module basic: understanding what is mind by

-function a module, transistor, diode, resistor, wire, to operate demonstration task allocation step,

- identify, t092, plastic casing code value,

- identify pen cell number component, traffic sign under control

Identify cell, pen light lead acid batteries

Identify carbon resistors, carbon composition, pre set resistor and potential,

Identify code, 1,2,3,4, condensate, polyester ceramic,

Wire identify negative black, red negative, switch,

Module: assessment follow to assess theoretical test, 2 class work, 3 project 4 on going , activity , self assessment ,

-engineering electrical assessment diplomat project 1, analysis discovery describe imagine

- Fundamental create power

- Research search check
- label your drawing
- let the small build light when you switch it
- be specific.

Analyze examination process degree difficulty engineering mark 100%
, close submission

Textbook, module engineering electrical. 3 hour 100mark, trimester

Analyze examination	Reproducti on 65	Applicati on 20	Analysi s 10	Evaluati on 5	Discover y, Investig ate Planer, imagine d	

Learning outcome module theory subject n1, pr- continuity n2 n6 ,
engineering science textbook moolman reference,

-presentation oral instruction n1 trimester 75 h test, evaluation student
must evaluated continual, after completing each written class test ,

- Module award definition : dictionary Colin an award is prize or certificate that a person is given for done something well ,
- Certificate is an official document stating that particular fact are true , receive , when you have complete of course of study or the qualification that you receive is something also post graduate ,

- She presented a bravery award to school girls , in low an award is a sum of money , that a court decides should be given to someone workman ,
- 3 a pays award is an increase in pay for a particular group of workers,
- Award certificate outcome court review argument judgment , dismissal landing development education court claim textbook, case book , award review , reconciliation mediation ,labour court reproduction photocopy outcome court , certificate record transcription is true correct magistrate library conger, diplomatic award councilor trading licensing, court dismissal miscellaneous , break , ruling award examination chief marker, student bogus high court assessment task examination subject ,
- -n counter , this year's average pay award for teacher of just

Department high education:

National certificate n1, n2, n3, n4, n5, n6

Engineering study

Award to: tshingombe tshitadi.

Identity number

With effect from 2019-11-01

Instructional offering passed

-engineering sciences

-Trade theory electrical,

-Industrial electronic.

-Mathematic

Examination

Officer

Saqa qualification, award degree diplomat

Certificate, 50%, pass qualify .1th, 2th, 3th, 4th

Engineering electrical study qualification

Award degree qualify, tshingombe tshitadi

Identity number

With effect from 2019-11-01

Instructional offering passed

-engineering science.

-Trade theory electrical,

-Industrial electronic.

-Mathematic examination, officer.

10. Topic project

- Create found circuit, cell 12v, 12 total circuit ah . what happen circuit ,
- Found; wire mm, m 2,5 mm . found switch , found bulb mw,
- Research search circuit parallel increase decrease voltage capacity label draw developing switch interconnect power ,
- Specific found power 12v
- Present class
- Topic series on parallel,
- Introduction : learning project theoretical test and class work , cell and batteries , important understanding of cells circuit
- Batteries important understand there is not really a resistor the emf is always bigger than the p.d
- Research circuit parallel ,
- Advantage and disadvantage : abstral recharged high internal resistance low internal , resistance high efficiency 90% individual cell can proved , therefore make 12 volte ,
- Specifically power : tools main switch on , off on output charge , overcharge , discharge explosive ,
-

ACTIVITY FRAMEWORK	MARK ALLOCATION	MODULE	RATING	CHECKING CORE COVERAGE POLICY ASSESSMENT, SAFE SECURITY	YES	NO	
CELL UNITY							
WIRE							
SWITCH							
BULB							

[Posted on Jun 29, 2018](#)

CCTV
INSTALLATION
TRAINING

JANUARY 2019
REGISTRATION
CURRENTLY IN
PROGRESS
AT
ST PEACE
COLLEGE & AFRIC
POLIC INSTITUTE
FULL TIME AND
PART TIME
CLASSES
AVAILABLE (DAY,
EVENING AND
WEEKEND
CLASSES)

Did you study
electrical but have
no Practical
Experience?
Do you need
Preparations for
your Trade T...

More National
Certificate N1-N3:
Engineering Studies
(Electrician)

Course Contents
N4

Mathematics
Electrotechnics
Logic Systems
Industrial
Electronics
N5

Mathematics
Electrotechnics
Logic Systems
Industrial

Electronics
N6

Mathematics
Electrotechnics
Logic Systems
Industrial
Electronics
Career
Fields/Further
Studies
Electrical
engineering is a
field of engineering
that generally deals
with the study and
application of
electricity,
electronics and
electromagnetism.

Electrical
Engineering is an
exciting and
dynamic field as
these electrical
engineers are
responsible for the
generation, transfer
and conversion of
electrical power.
These sought-after
engineers are in
demand and
contributes
positively to the
industry skills
shortages.

St. peace college
Requirements:

One of the
following:

N2 National
Certificate
Grade 11
Senior Certificate

NSC (Maths or
Maths Literacy
required).
Time you will spend
on the course
This is a two-year
course with two-
year in-service
training full time.

Course content and
modules
You will cover these
modules during the
duration of your
diploma.

National N3
Certificate
(Engineering
Studies: Civil
Engineering)

1st year, 1st
Semester Subjects

Mathematics N3
Building and Civil
Technology N3
Building Drawing
N3
Building Science N3
National N4
Certificate
(Engineering
Studies: Civil
Engineering)

1st year, 2nd
Semester Subjects

Mathematics N4
Building and
Structural
Construction N4
Building and
Structural
Surveying N4
Building

Administration N4
National N5
Certificate
(Engineering
Studies: Civil
Engineering)

2nd year, 1st
Semester Subjects

Mathematics N5
Building and
Structural
Construction N5
Building and
Structural
Surveying N5
Building
Administration N5
National N6
Certificate
(Engineering
Studies: Civil
Engineering)

2nd year, 2nd
Semester Subjects

Mathematics N6
Building and
Structural
Construction N6
Building and
Structural
Surveying N6
Building
Administration N6
contact us on
whatsapp:
0763091083 /
0746671503
landline:
0110517585

JOIN US FOR THE
SECOND
SEMESTER AND
GET OFFER BY:

ST PEACE
COLLEGE

DIPLOMA IN
POLICING

MAY 2018 INTAKE

REGISTRATION
CURRENTLY IN
PROGRESS

AT
ST PEACE
COLLEGE

National Certificate
in Traffic and
Policing NQF L6
61729

(RESOLVING OF
CRIME)

FULL TIME AND
PART TIME
CLASSES
AVAILABLE (DAY,
EVENING AND
WEEKEND
CLASSES

The DIPLOMA IN
POLICING-FIRST
YEAR focuses on
officials in the
Detective Services
Division or officials
that aspire to
become detectives.
This would include
officials within the
Department of
Safety and Security,
for instance
members of the
South African Police
Service (SAPS) or
members of private

institutions that
deal with instances
of violence or crime.
The content of this
course would
therefore deal with
a variety of skills
that are necessary
when performing
policing functions.

In short it entails
the following:

FIRST SEMESTER

Modules

Criminal
Investigation
Principles
Administration and
Communication
Skills
Information
Management
PRACTICAL
TRAINING

National Certificate
Resolving of crime
is a vocational
course

Vocational means
that at the end of
the training the
learner must have
acquired practical
skills and hence if
employed is ready
to deliver right
away.

Types of Practical's
a learner will do
during training:

Police visit, Patrols, Arrest procedure, search procedure, Evidence collection/Preservation and presentation. Identifying Types of evidence
 Operate in teams during patrols
 Use of surveillance cameras
 Cover actions by police/Facilitative and preventive undercover operations, Perusal of informant register. Informant recruitment methods. Attend informant briefing session
 How to handle the gun and shooting techniques
 Preparation of case dockets when opening cases of reported crimes
 Drill or marching and saluting compliments
 Practical Assessment
 contribute 70 % of

the syllabus and theory assessment contribute 30%.

SECOND SEMESTER

Modules

Crime scenes and Incidents
 Investigative Methods and Techniques
 Vehicle Crime Investigation

Career Opportunities: On completion of National Diploma Policing you will be qualified to work in:-

Areas of Security & surveillance,
 Private Security, SAPS
 Metropolitan Police, Community Policing
 National Intelligence.
 Private Investigation

2018 STUDENT SPECIALS:

BE A ST PEACE COLLEGE STUDENT TO QUALIFY

FREE WIFI

24 hours internet

TRANSPORT IS AVAILABLE TO COLLECT YOU FROM MTN , PARK STATION AND BREE TAXI RANK WHEN VISITING JOHANNESBURG FOR THE FIRST TIME..

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 whatsapp 074 6671503



[Posted on 25-Jun-2018](#)

NATIONAL DIPLOMA IN
RESOLVING OF CRIME-SECOND
YEAR

NQF L6 61729

JANUARY 2019 INTAKE

REGISTRATION CURRENTLY IN
PROGRESS

AT

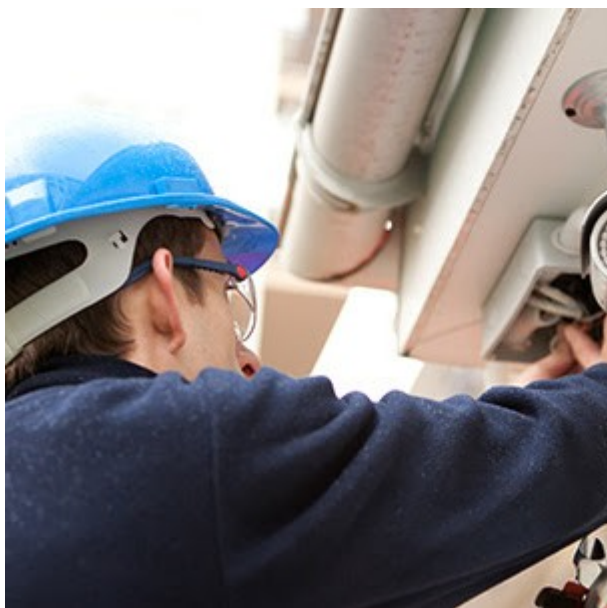
ST PEACE COLLEGE

(AFRIC POLICING INSTITUTE)

SASSETA ACCREDITATION

NUMBER 111999691949

FULL TIME AND PART TIME
CLASSES AVAILABLE (DAY,
EVENING AND WEEKEND
CLASSES



Posted on Jun 29, 2018

ST PEACE COLLEGE & AFRIC POLICING INSTITUTE

CCTV INSTALLATION TRAINING

JANUARY 2019
REGISTRATION
CURRENTLY IN
PROGRESS
AT
ST PEACE
COLLEGE & AFRIC
POLIC INSTITUTE
FULL TIME AND
PART TIME
CLASSES
AVAILABLE (DAY,
EVENING AND
WEEKEND
CLASSES)
Did you study
electrical but have
no Practical
Experience?
Do you need
Preparations for
your Trade Test?
You have no
Qualification but
you want to equip
yourself with basic
electrical skills TO
START YOUR OWN

BUSINESS and BE YOUR OWN BOSS?

We have one of the
Best Engineering
Workshops in the
Country for you.
They are world class
state of Art
Workshops. If
trained with us you
can work anywhere
in the World.

CCTV INSTALLATION,

COURSE CONTENT

\ CCTV Systems:-
Introduction and
uses.
\ Elements of a
basic CCTV system:-
Camera, monitor
and digital recorder.
\ Camera types and
uses:- Fixed and
movable, indoor and
outdoor,
monochrome and
colour, day and
night.
\ Camera
specifications:-

Sensitivity, signal to
noise ratio and
resolution.

\ Back Focus
adjustment.
\ Lens types:- Fixed
and variable focal
length, manual and
motorised zoom.
\ Use of lens
calculator.

\ Scene
illumination:-
Lighting
considerations,
LED's, infrared
lamp maintenance
and bulb life.

\ Switches, Quads,
Multiplexers and
control systems: -
Types and
applications.

\ Monitors and
Multiple screen
displays.
\ Recording the
footage:- Analogue
and Digital video
recorders.

\ Time-lapse
recording.

Reviewing video footage.
} Cables and connectors: – Types, uses, limitations, preparation and testing.

[ST.Peace college](#)

January 16, 2019 ·

Register now for:
National Certificate in Mechanics NQF level 2 and 3
National Certificate in Air Conditioning Refrigeration and Ventilation NQF level2

POLICING ACADEMY

1. NATIONAL DIPLOMA IN POLICING NQF LEVEL 6

2. NATIONAL CERTIFICATE IN PARALEGAL PRACTISE NQF LEVEL 5

3. NATIONAL CERTIFICATE TRAFFIC LAW NQF LEVEL 5

4. BUSINESS STUDIES N1-N6

5. PLUMBING

6. N3 TECHNICAL MATRIC

7. MATRIC REWRITE

8. NATIONAL CERTIFICATE IN INFORMATION TECHNOLOGY

9.. MICROSOFT OFFICE

10. A+; N+

11. COMPUTERISED CASHIER

REGISTRATIONS FOR SECOND SEMESTER ARE OPEN.
REGISTER THE COURSE OF YOUR CHOICE.

NATIONAL DIPLOMA IN:

MARKETING
HR MANAGEMENT
BUSINESS MANAGEMENT
PUBLIC MANAGEMENT
FINANCIAL MANAGEMENT
ELECTRICAL ENGINEERING
PLUMBING
N3 TECHNICAL MATRIC

FACULTY OF INFORMATION TECHNOLOGY

COMPUTER LITERACY
MICROSOFT OFFICE A+ N+ CERTIFICATES
COMPUTER CASHIER
RECEPTIONIST
COURSES WITH COMPUTER SKILLS
SECRETARIAL COURSE WITH COMPUTER SKILLS

Our objective is to give learners an advantage by preparing them for the workplace. Giving learners employable skills, and an all round education.

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ST Peace College
The Markade bulding 5th floor
office 547N,
Johannesburg,
Gauteng, South Africa 2003
0113330171

St Peace College and Africa Policing Institute, Johannesburg



2001 Johannesburg
Gauteng
076 309 1083
011 333 0171
Send message
Security Guard
Security x 6

Security Guard Security x 6

Position: Security
Guard Security x 6

Vacancy type:
External/Internal

Task Grade: T05

**Area of
Specialization:** To
protect Eskom's
assets and interest
by performing
physical security
duties

- PSIRA Grade C
- Drivers licence

Key Responsibilities

- Perform access
control duties
- Perform patrol
duties
- Perform
reaction/response
team duties
- Perform
emergency

St Peace College
and Africa Policing
Institute
The Markade
Building 5Th Floor

Department:
Protective Services

Business Unit :
Arnot Power Station

Location : South
Africa
(Mpumalanga)

**Reference
Number:** 329-
1631109IS

Closing Date:
5/8/2014

**Minimum
Requirements**
Qualification(s):
• Grade 12
• Private Security
Regulation
Authority
• Registration at
National Key Point
level

preparedness duties

- Perform guard
duties

"If you have not
been contacted
within 28 days after
the closing date of
this

84 President &Cnr
Kruis Street Johan

Skills and Competencies

- Physical fitness to
perform operational
duties
- Mental fitness to
perform under
stressful and
dangerous
situations
- Analytical skills
- Communicate
ideas and concepts
clearly to
supervisor,
colleagues,
customers and
stakeholders.
- Effective customer
care skills
- Sound
interpersonal and
industrial relations
skills
- Ability to think
creatively
- Leadership skills
- Computer literacy

advertisement,
please accept that
your application was
unsuccessful."

The appointment of
the candidate is at
the Manager's sole
discretion, taking
into account factors
which Eskom
consider relevant
including but not
limited to Eskom's
Employment &

Occupational Equity Policies, Strategies & Guidelines. Also note that Eskom supports a smoke-free environment.

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<https://image.slidesharecdn.com/9614f5>

45%, passed emalusie

emalusie 45% n1,n2,n3 grade 12 metric 45% pass, no qualify ,, saqa award credit 20to 90 .

national diplomat: st peace college semester

Department high education:	Saqa qualification, award degree diplomat
<p>National certificate n1, n2, n3, n4, n5, n6</p> <p>Engineering study</p> <p>Award to: tshingombe tshitadi.</p> <p>Identity number</p> <p>With effect from 2019-11-01</p> <p>Instructional offering passed</p> <p>-engineering sciences</p> <p>-Trade theory electrical,</p> <p>-Industrial electronic.</p> <p>-Mathematic</p> <p>Examination</p> <p>Officer</p>	<p>Certificate, 50%, pass qualify .1th, 2th, 3th, 4th</p> <p>Engineering electrical study qualification</p> <p>Award degree qualify, tshingombe tshitadi</p> <p>Identity number</p> <p>With effect from 2019-11-01</p> <p>Instructional offering passed</p> <p>-engineering science.</p> <p>-Trade theory electrical,</p> <p>-Industrial electronic.</p> <p>-Mathematic examination, officer.</p>

Report engineering learning mult-idisciplinairy

-n1-n6

Date subject code, time table.

2018-11-22

X	BRICKLAYING AND PLASTERING THEORY N1	MESSEL- EN PLEISTERTEORIE N1	11010091
X	ELECTRICAL TRADE THEORY N1	ELEKTROVAKTEORIE N1	11041861
X	ELECTRICAL TRADE THEORY N3	ELEKTROVAKTEORIE N3	11041263
X	ENGINEERING PHYSICS N5	INGENIEURSFISIKA N5	15070115
X	FOUNDRY THEORY N1	GIETERYTEORIE N1	11020221
X	INDUSTRIAL ELECTRONICS N6	INDUSTRIELE ELEKTRONIKA N6	8080186
X	INSTRUMENT TRADE THEORY N3	INSTRUMENTVAKTEORIE N3	11040463
X	MECHANOTECHNOLOGY N3	MECHANOTECHNOLOGIE N3	8190373
X	METAL WORKERS' THEORY N1	METAALWERKERSTEORIE N1	11022061
X	MOTOR BODYWORK THEORY N1	MOTORBAKWERKTEORIE N1	11040561
X	MOTOR BODYWORK THEORY N3	MOTORBAKWERKTEORIE N3	11040583
X	MOTOR ELECTRICAL THEORY N1	MOTORELEKTROTEORIE N1	11040601
X	MOTOR ELECTRICAL THEORY N3	MOTORELEKTROTEORIE N3	11040623
X	MOTOR TRADE THEORY N1	MOTORVAKTEORIE N1	11040651
X	MOTOR TRADE THEORY N3	MOTORVAKTEORIE N3	11040673
X	PICTORIAL DRAUGHTING	PRENTEKENWERK	8090214
X	PLANT OPERATION THEORY N1	AANLEGBEDIENINGSTEORIE N1	11040001
X	PLANT OPERATION THEORY N3	AANLEGBEDIENINGSTEORIE N3	11040023
X	PLUMBING THEORY N1	LOODGIETERSTEORIE N1	11022041
X	RADIO AND TELEVISION THEORY N1	RADIO- EN TELEVISIESTEORIE N1	11040821

ENGINEERING FIELD OF STUDY NOVEMBER 2018: PER DAY TIME TABLE

6

Electrical
Engineering

Application.
NATIONAL
CERTIFICATES **N1**
- N3: ELECTRICAL
ENGINEERING. The
N1 to N3 National
Certificates in the
Electrical

Engineering
programmed cover
heavy current as
well as light
current. Heavy
current includes the
distribution of
electricity, domestic
wiring, civil and
industrial
industries.

Degree: Bachelor of
Engineering

[**NATIONAL
CERTIFICATES N1
- N3: ELECTRICAL**](#)
.

What is n1
qualification?
Programme Type
The National
Certificate in
Engineering Studies
is a National

Qualification
delivered under the
auspices of the
Department of
Higher Education
and Training. The
N1 to N3
Engineering Studies
qualifications are
registered on the
NQF as follows: **N1**:

SAQA ID 67109. N2:
SAQA ID 67375.
How long does n1
course take?
The electrical
course covers
mathematics,
engineering science,
industrial
electronics and
electrical trade

theory over a period of 36 months. This means that each Is n3 and matric the same?

N3 certificate equivalent to **Matric** is issued by the regulatory body Umalusi for more

level, **N1** to N3, **takes** 16 months to complete and information click here and exams are conducted by the Department of Higher Education and Training. ... With **N3** Technical

consists of four modules that build on each other. **Matric** you can apply for jobs, study further .and uses it for any place requiring a National Senior Certificate.

11.TOPIC.. ASSESSEMENT. Tasks for First Additional module, st Peace College, electrical engineering

Task	Time - frame	Type of assessment activity	Scope of Assessment	Suggested Marks Allocation	% contribution to the year mark		
	TERM 1						
	TERM 2						
	TERM 3						

TASKS	Time - frame	Type of assessment activity	Minimum time and proposed mark allocation	Scope of assessment	% contribution to the year mark Do not confuse			
-------	--------------	-----------------------------	---	---------------------	--	--	--	--

			(*can be increased but not reduced)		the weightings of topics in the Subject Guidelines with the % contribution to the year mark			
1	TERM1	TEST PRACTICE ASSESSMENT ASSIGNMENT	1H00, 50MARK	50MARK Determined by the scope and nature of the task	TOPIC COMPLETED TERM	10 25		
2	TERM2					25		
3	TERM3							
			exam					
	Total					100 %		

Name :tshingombe tshitadi

Research career implantation circular qualification engineering electrical

Saga institutes foreign:saga transcription meeting 71638, required graduate award diplomat NQF high .certificate. no meeting .leave school , expanded Assessment.

Work experimental theoretical practical , assessment

**Engineering electrical job .and engineering brigade
defense .police brigade , securities brigade, safety brigade job
career /site and office council college and institute**

1 .scope: job engineering electrical and technical job career .

Qualifications engineering and technical , security engineering and safety
engineer and policy engineering defense engineering and council trade

engineering technical .
Mandatory government land skill development

1.1 content : job engineering qualifications engineering n diplomat. n certificate government ,

1.1.1 guidelines orientation supervisor. management engineering task
junior engineer staff , principal engineering work , semester trimester years
gov, council occupation engineering trade , council engineering
Engineering technology, engineering technical

1.2 purpose: job engineering qualifications n grade engineering framework regulation . Engineering

1.3 . operational engineering m.workplace . theoretical workplace and
practical workplace office ,
Office .,
Engineering in-service
Log activities day sign .. log
Code trade engineering subject, module engineering trade , assignment
engineering .task engineering sheet engineering .

1.4.Duty engineering post office : engineering principles log activities council engineering , qualifications engineering criteria minimum credit ,, council engineering

1.5.shift day , night.. attendance day office engineering. Service.

Design analysis investigation.
Office engineering.
Case study council engineering design subject, qualifications outcom ,
Subject module activities. Sign
30days.

1.6.salary projection engineering council engineering case council building assessment assignment Work permit visa scaling module weighting...

7. Permit condition work visa applying

1.7 . Saqa instituts foreign:saqa transcription meeting 71638, Dr Congo requireded graduate award diplomat NQF high .certificate. no meeting .leave school , expanded

Assessment.

exam d etat diploma, certificate professional motoring special,
certificate informatique mathematics office.

Certificate attestation preparatory technicien pedagogy,

-Primairy status registration saqa asset 09121, saqa instituts ,30-39 NC

ASSESS policy IE099,

Saqa decision 10105/14 advance intermediate phase teach .

N1-saqa I'd 6710 certificate

N2saqa I'd 63375,

I'd 67491 entrance.

Application:for the evaluation of qualifications and experience to
comply with the requirements of national n diplomat:

-Name of application: tshingombe Tshitadi Fiston

-ID number :TIRCO000910610

applications:201911130002,, ,210002023812,200400706438

Examination centre:89992880

-Email address: tshingombekb@gmail.com

-fax number:0725298946

-qualificatiin title: national N diplomat engineering electrical,

-Minimum credit:360

-NQL level: 6

-Date submitted to Dhet : 11/05/2023

-ID workplace expirience : saqa n assessor 201911130002/ , I'd
21000223812/ COM 18260900

Employer number. -Primairy status registration saqa asset 09121,
saqa instituts ,30-39 NC

ASSESS policy IE099,

Saqa decision 10105/14 advance intermediate phase teach .

N1-saqa I'd 6710 certificate

N2saqa I'd 63375,

I'd 67491 entrance.

Student ID: 2100002023812.

Student name.tshingombe Tshitadi

Recent applications

Submission No	Name	Date	Status	Electronic Certificate
202303115021	Tshitadi Fiston Tshingombe Tshitadi	2023-03-11 13:45	Pending Document(s)	engineering n electrical
2022071250	tshitadi tshingombe	2023-01-	Pending	engineering n

14		16 13:31	Document(s)	electrical
202207085055	Tshitadi Tshingombe	2023-01-16 13:24	Pending Document(s)	engineering n electrical
202211165081	fiston tshingombe	2022-11-16 14:41	Submitted	engineering n electrical

Overview	Qualification Holder	History of Learning	Purpose	Results	Online access to evaluation	Terms and Conditions
----------	----------------------	---------------------	---------	---------	-----------------------------	----------------------

SAQA QUAL ID, QUALIFICATION TITLE ; 73313, National Certificate: Electrical Engineering ; ORIGINATOR ; SGB Electrical Engineering & Construction.

[9839 - SAQA](#)

This unit standard is for persons in the Electrical Engineering; Generation; Distribution; Transmission, Construction and Renewable Energy Sectors.

[246659 - SAQA](#)

Demonstrate and understanding of electrical and electronic technologies, via verbal and practical demonstration. This would include calculations on the various ...

[119256 - SAQA](#)

Prepare work area. Inspect electrical circuits. Test electrical circuits. Complete work activities. LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION ...

[258960 - SAQA](#)

This unit standard is for persons in the Electrical Engineering; Generation, Distribution, Transmission, Construction and Renewable Energy Sectors.

[20420 - SAQA](#)

Summarise, predict and apply technical operations using the fundamental systems, procedures and
analyse design

[72052 - SAQA](#)

This electrical engineering qualification provides the advanced competencies required to work on integrated electrical systems and installations. This ...

48475, National Certificate: Electrical Engineering. ORIGINATOR ... With this understanding, learners will be able to participate in workplace activities

Make a career out of your passion study at AIE | School of Engineering & Science.
Time & Co

[258937 - SAQA](#)

This r
in the Electrical Engineering;
Generation; Distribution;
Transmission, Construction,
Mining, Chemical and Renewable
Ene

[484](#)

Subject: APPLICATION FORM
FOR F

Ref.:

CANDIDATE

Application for Registration
as: (Tick appropriate block ☐)

Compile

andidate Engineer

MB Mtsnan

Please include a certified copy
of your BSc Eng/B Eng Degree

Approving Officer:

EL Nxumalo

Cand
Tech

Next R

14/02/

of 6

Please include certified copies
of your National Diploma and
B Tech Degree certificates and
include a

of your statement of results
for the N Dip and the B Tech

CONTROLLED DISCLOSURE

It is t
user
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version will be published on
ECSA Document Management
system.

QM TEM 003 Rev 0 27-11-
2017

Office

Candidate Certified
Engineer

ase in
our C

Candidate Engineering
Technician

Please include a certified copy
of your National Diploma
Certificate

Candid

**Please include a certified copy
of your National Diploma**

**Automated
result
award
diploma./irregularity
case .re marker**

Inbox

engineer
[via dkim.mimecast.org](mailto:dkim.mimecast.org)

Sat, May 13, 2:19 PM
days ago)

to
me

Dear Valued Sta

-

Due to high volumes of calls and emails we might take longer than usual
to respond to your queries. Your patience in this regard is highly
appreciated.

-

Regards,

ECSA TEAM.

tshingombe fiston
<tshingombefiston@gmail.com>

Sat, May 13, 2:21 PM (13
days ago)

to
engineer

Thank you for your resp

Applying for Registration as a Candidate Engineer

1. Download the [application form](#)
2. Fully complete the first two pages of the application form E1.1
E 1.2, both pages signed by yourself and the commissioner of
oaths(include commissioners stamp).
3. Include a certified copy of your B Sc(Eng)/B Eng Degree(not a
of a certified document.
4. Attend to payment of applicable application fees and include p
of payment in your application. You may use your Full
names/Identity number as payment reference.
5. Submit the originally completed and commissioned application
ost or direct delivery to our offices.

Candidate Engineering Technician

Karabo Keepilwe
<karabo@ecsa.co.za>

Tue, May 23, 12:05 PM (3
days ago)

to
me

Good day

-

Your application has been received with thanks

Howev

- Not signed by the Commissioner of Oath
- No proof of payment attached.

- No qu

Regards

From: engineering-oconnect <engineering-oconnect@ecsa.co.za>
Sent: Wednesday, May 17, 2023 1:33 PM
To: Karabo Keepilwe <karabo@ecsa.co.za>; Deborah Haynes <deborah@ecsa.co.za>; Lesego Mothupi <lesego@ecsa.co.za>
Subject: Fwd: Re: Automatic renlv: Release resultat statement and finalize avse .re marker

Dear Karabo

QCTO OCCUPATIONAL QUALIFICATION/PART-QUALIFICATION/SKILLS PROGRAMME

EVALUATION CHECKLIST TEMPLATE
POLICY (2021) OCCUPATIONAL TYPE (NOMENCLATURE)

QUALIFICATION DOCUMENT REPORT TEMPLATE

NB: This Qualification Development Report requires the utilisation of a QCTO Qualification Document Template. This report must be compiled by the QP and is submitted to the QCTO

in preparation for the QAS Addendum Development and Final Verification Meetings.

1. QCTO approved application details: which the Qualification Development based:

CURRICULUM REPORT TEMPLATE

NB: This Curriculum Report is to be compiled by the QP. This report requires the utilisation of the Curriculum Document Template and is submitted to the QCTO within 10 working days after the Curriculum Document is finalised.

1. QCTO approved application details:

SCOPING REPORT TEMPLATE

NB: This Scoping Report is to be compiled by the QP and is submitted to the QCTO within 10 working days after the Scoping Meeting.

QCTO OCCUPATIONAL CURRICULUM REPORT-QUALIFICATION/SKILLS PROGRAMME

EVALUATION CHECKLIST TEMPLATE
IN LINE WITH THE OQSF POLICY (2021) OCCUPATIONAL QUALIFICATION TYPE (NOMENCLATURE)

Skills Programme/learnership, etc.	Estimated number of beneficiaries	Province	District Municipality	Local Municipality
project				
Duration				
24 months) Expected Start Date:				
Date: January				
2023/01/ 02				
Expected End Date: 2023/02/3				

1.7 Project Activities

Natural Resource	Project	Partner	Year 1	Year 2

tshingombe fiston
<tshingombefiston@gmail.com>

May 13, 2023,
1:14 PM

to tahitadit
tshitaditshin

EKB, me,

Please be aware that the ECB is a Not for Profit organisation and as such we are limited by our resources and budget to help you. Please be patient as we have in excess of 7,000 cases each year and we want to ensure each case gets the time it deserves.

If you are happy with the service you have received, please feel free to send us a donation or a letter of appreciation to help us continue to help our contributors that help make the electrical sector a safer.

for you and we appreciate everyone of our contributors that help make the electrical sector a safer.

completed a relevant Trade Test or worked in a technical environment relevant to the specialised theoretical subjects:
OFO-CODE

TRADE

[√]

COMMENT
S

in test functions/displays
WA2005

Adjusting/tuning and calibrating electronic equipment/sub

assemblies
WA2010

Checking electronic equipment/sub

assemblies, components, connections and terminations for conformance to specifications
WA2006

Returning to service and testing to specification the repaired electronic equipment/sub

06
Removing and replacing/repairing faulty components from the electronic equipment
WA2007

11
Using language and literacy skills to provide brief reports/records/results of
WA2012

Recording results of tests undertaken on electronic equipment
WA2008

Reproducing fault symptoms the electronic equipment and verifying faults using appropriate test equipment and fault finding techniques

Isolating electronic sub assembly from the power supply
90674: National N Diploma, Engineering Studies: Electrical Engineering
22
WA2009

WA2013

Refitting repaired/replaced components into the assembly
21

Maintain/service
analog/digital
electronic
equipment
Date
Signature

Look for evidence that
confirms skills in:
WA2101
Following relevant circuit
diagrams, manuals,
specifications, schematics,
maintenance records,
supplier catalogues etc.
WA21
02

Locating and
reading/recording
built
=
in fault indicators
WA21
03

Obtaining error code
interpretation documents
WA21
04
Running test functions and
recording faults and/or
equipment status indicated by
built
=
in test
functions/display
WA21
05
Checking elect
equipment/sub
=

assemblies,

components, connections and
terminations for
conformance to specifications
WA21
06
Removing and replacing
components from the
electronic equipment
WA21
07

Isolating electron
=
assembly from th
supply

90674: National N Diploma,
Engineering Studies:
Electrical Engineering
23
WA210

Adjusting/tuning and
calibrating electronic
equipment/sub
=
assemblies
WA2109

Returning to service and
recification of electronic
equipment/sub
assembly
WA21

Recording test results

WE22

Modify electronic equipment

Date

Signature

Look for

Testing, checking modified electronic equipment to ensure conformance to specifications

WA2200

evidence that confirms skills in:

WA2201

Obtaining relevant circuit diagrams, schematics, manuals

WA2202

Isolating, tagging and verifying isolated equipment

WA2203

Removing and refitting

=

assembly/equipment on the system

WA2204

Entering routine and familiar information onto pro

=

forma and standard workplace forms

WA2200

Locating, reading and interpreting information on written job instructions, specifications, drawings, charts, lists and other reference documentation

WE23

Carrying out modifications to specification

WA2205

Maintain, repair control instrumentation

=

single

Amending circuit diagrams, schematics, equipment manuals, specifications affected by the modifications

WA2206

and multiple loop control systems

Date

Signature

Recommissioning electronic equipment

WA2207

Look for evidence that confirms skills in:

WA2301

Obtaining and interpreting relevant engineering specifications, technical information, software data, diagrams and drawings, historical records and documents pertaining to the system components and operational data
WA2302

Consulting system operators and other relevant plant personnel with respect to the control system characteristics
WA2303

Confirming function/malfunction of the system and/or its components
WA2304

Checking operational characteristics of control devices, signal conversion instruments and final control elements for conformance to specification
WA2305

Identifying faults/defects in control system

components
WA2306
Locating/reading in
=

built fault indicators and error codes
WA2307

Obtaining relevant pneumatic, electrical and electronic circuit diagrams
WA2308

Testing and monitoring the control loop for correct operation
WA2309

Monitoring and recording responses of the control system
WA2310
Using appropriate

=
finding and diagnostic techniques and procedures throughout the monitoring and testing process

WA2311
Comparing collected data with the operational specifications of the control system
WA2312

Marking components for repair or replacement
00674: National N Diploma, Engineering Studies: Electrical Engineering

WA2313

Dismantling/disassembling serviceable items

WA23

14

Setting up appropriate test and calibration equipment

WA23

15

Setting and adjusting the controller modes

WA23

16

Checking the control instrumentation for correct zero,

span and range

WA23

17

Adjusting the control system as required

WA23

18

Completing all necessary reports including appropriate follow

=

up procedures

WA23

19

Commissioning the control system

WA23

20

Interpreting trends from operational data

WA23

21

Interpreting information from in

=

built devices

WA23

22

Calculating control loop characteristics

WE24

Install, maintain and calibrate instrumentation

sensors, transmitters and final control elements

Date

Signature

Look for evidence that confirms skills in:

WA2401

Accessing relevant data sheets, circuit diagrams, engineering drawings, instructions, specifications, information

and supplier catalogues and replacement components

WA2402

Selecting sensors, transmitters and final control elements

90674: National N Diploma, Engineering Studies: Electrical Engineering

26

WA2403

Installing and testing sensors, transmitters and final control elements to specification

WA2404

Planning and performing maintenance

scheduled/preventative maintenance schedules for

sensors, transmitters and final control elements

WA2405

Determining correct function of sensors, transmitters and final control elements

WA2406

Recording test results

WA2407

Identifying,

troubleshooting, monitoring and recording faults in

sensors, transmitters and final control elements

WA2408

Preparing sequential action plan to correct faults in sensors, transmitters and final control elements

WA2409

Applying procedures to sequential and loop testing

WA24

10

Checking sensors, transmitters and final control elements and marking for replacement, repair or overhaul

WA24

11

Repairing/overhauling faulty items for fitting and /or refitting

WA24

12

Fitting/ refitting sensors, transmitters and final control elements

WA24

13

Preparing fitted/refitted sensors, transmitters and final control elements for testing and calibration

WA24

14

Configuring, calibrating, testing, adjusting, tuning and validating system performance

WE25

Terminate signal and cables

Date

Signature

WA2501

Identifying cables and conductors

WA2502

Labelling cables and conductors

90674: National N Diploma, Engineering Studies:

Electrical Engineering

27

WA2503

Obtaining relevant instructions, specifications and data sheets

WA2504

Preparing cable ends termination

WA2505

Following specifications

WA2506

Testing completed terminations for compliance to

specifications

WA2507

Fixing/securing cables

WE26

Maintain instrumentation system components

Date

Signature

Look for evidence that confirms

skills in:

WA2601

Obtaining relevant data with respect to the operation of the instrumentation systems/equipment

WA2602

Locating, inspecting and testing a range of instrumentation system components

WA2603

Isolating instrumentation system/equipment

WA2604

Obtaining and interpreting all relevant instrumentation circuits, drawings, instructions, manuals and data sheets

WA2605
Checking the individual components within the instrumentation system for correct operation
WA2606
Dismantling/repairing/reassembling faulty components
WA2607
Selecting correct replacement parts from the manufacturer/supplier catalogues
WA2608
Checking repaired/replaced instrumentation system components for correct operation
90674: National N Diploma, Engineering Science
Electrical Engineering
28
W
A2609
Completing service reports
WA26
10
Obtaining error code interpretation documents
WA26
11
Recording/documenting test results
WA26
12
Undertaking zero, span and range checks on instrumentation systems/equipment
WA26
13
Calibrating instrumentation system/equipment
WE27

Diagnose and repair digital equipment and components
Date
Signature
Look for evidence that confirms skills in:
WA2701

Obtaining relevant circuit diagrams, manuals, schematics, specifications, maintenance records, supplier catalogues
WA2702

Locating, reading/recording and diagnosing built

fault indicators
WA2703

Obtaining error code interpretation documents
2704

Running test functions and recording faults and/or equipment status indicated by
It

test functions/display
2705

Checking electronic equipment/sub

=
assembly

components, connections and terminations for conformance to specifications
WA2706

Removing and replacing/repairing faulty components from the electronic equipment
WA2707

Recording results tests on electronic equipment
90674: National N Diploma, Engineering Science
Electrical Eng
29
WA2708

Isolating electronic sub

=

assembly from the supply
WA2709

Adjusting/tuning and calibrating electronic equipment/

=
assemblies
WA27

10

Returning to service and testing to specification the

repaired electronic equipment/sub

=
assembly
WA27
11

Maintaining a safe and clean condition workplace

Carrying out workplace activities such as working safely, not endangering others, following company and legislative requirements, following procedures
WA2804

Selecting, wearing and storing appropriate personal protective equipment
WA2805

Using appropriate safety equipment and devices
WA2806

Carrying out work with the information given by safety signs and symbols
90674: National N Diploma, Engineering Studies: Electrical Engineering
30
WA2807

Carrying out manual handling principles
WA2808

Using emergency equipment correctly

WA2803

WA

2809
Noting workplace hazards
WA28

10
Contacting appropriate personnel and emergency services in the event of an accident
WA28
11

Following emergency and evacuation procedures
WA28
12

Communicating and interpreting information appropriate to OH&S within the scope of this unit
WA28
13

Checking and clarifying task - related information
WA28

14

Communicating with
emergency personnel

WA28

15

terminate and connect electrical
wiring

Date

Signature

Look for evidence that
confirms skills in:

WA0301

Checking materials for
conformance to
specifications

WA0302

Checking existing and new
installation site for correct
location and specification

WA0303

Making
terminations/connections to
specification,
manufacturer and regulatory
requirements

WA0304

Adjusting and fixing wiring
supports

WA0305

Marking, tagging and
labelling cables, wires,
conductors and connections to
specification

WA0306

Undertaking testing of wiring
and connections for
conformance to specification

WA0307

Using language and literacy
skills to complete short
reports and required
documentation

WA0308

Reading and interpreting
routine information on written

Checking for conformance to
specifications

job instructions, specifications
and

pro

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WA

Usi

che

con

s

WE4

Install and test electrical
wiring and circuits up to
1000 volts a.c. and 1500 volts
d.c.

Date

Signature

Look for evidence that
confirms skills in:

WA0401

Interpreting circuits,
drawings, specifications and
instructions

WA0402

Preparing work
plans in accordance with
legislative

and regulatory requirements
and standard operating
procedures and hazard and
safety requirements

erifying machine operation or
process output

WA0503

Obtaining specific changes
required to operating
parameters within the
software program

WA0504

Adjusting/changing
operational parameters

WA0505

Checking machine operation
or process output

WA0506
Reporting
WA0507
Identifying problems
WA0508
Reading, interpreting and
following information on
written job instructions,
specifications, standard
operating procedures, charts,
lists, drawings
and other
applicable reference
documents
WA0509
Planning and sequencing
operations
WA05
10
Checking and clarifying task
related information
WA05
1
1
Checking for conformance to
specifications
WA0512
Undertaking nu
90674: National N Diploma,
Engineering Studies:
Electrical Engineering
11
WA09
10
Checking for conformance to
specifications
WA09
11
Undertaking numerical
operations involving addition,
subtraction, multiplication,
division, fractions and
decimals within the scope of
this unit
WA09
12
Preparing drawings as
required
WE10

Use power tools/hand held
operations
Date
Signature
Look for evidence that
confirms skills in:
WA10
01
Reading and following
information on standard
operating procedures
WA1002
Following verbal instructions
WA1003
Selecting power tools
appropriate to the task
WA1004
Using power tools safely
WA1005
Using clamping/securing
devices
WA1006
Identifying power tool defects
WA1007
Maintaining power tools using
appropriate techniques
WA1008
Sharpening tools/tool bits
W
A1009
Storing power tools according
to manufacturers' /
standard
operating procedures.
WE1
1
Fault find/repair electrical e
btaining circuit diagrams,
specifications, schematics
WA1102
Isolating electrical
equipment/component from
the
power supply
WA1103
Tagging and checking isolated
electrical
equipment/component
WA1104

Locating and reading/recording built
=
in fault indicators
WA1105
Checking and testing electrical
equipment/component
for correct operation
WA1106
Verifying variations from
specifications indicated by
initial test results
WA1107
Identifying and localising
faults in electrical equipment/
components
WA1
108
Recording/reporting faults in
the
electrical
equipment/components
WA1109
Repairing, replacing or
adjusting electrical
equipment/components to
specification
WA11
10
Referencing supplier
catalogues
WA11
11
Confirming that the electrical
equipment/components
have been returned to
specification
WA11
12
Recording rectification of the
electrical equipment/
components
WE
1
2
Fault find/repair electrical
equipment/components

up to 1000 volts a.c./1500
volts d.c.
Date
Signature
Look for evidence that
confirms skills in:
WA
12
01
Using
diagnostic skills to identify
correct and faulty
operation
90674: National N Diploma,
Engineering Studies:
Electrical Engineering
13
WA1202
Interpreting and using circuit
diagrams, specifications
WA1203
Isolating electrical
equipment/components from
the
power supply
WA1204
Tagging isolated electrical
equipment/components
WA1205
Checking electrical
equipment/components for
isolation from the power
supply
WA1206
Locating and
reading/recording built
=
in fault indicators
WA1207
Obtaining error code
interpretation documents
WA1208
Checking and
testing electrical
equipment/components for
correct
90674: National N Diploma,
Engineering Studies:
Electrical Engineering

23

WA2108

**Adjusting/tuning and
calibrating electronic
equipment/sub**

**=
assemblies**

WA2109

**Returning to service and
specification of electronic
equipment/sub**

**=
assembly**

WA21

10

Recording test results

WE22

Modify electronic equipment

Date

Signature

Look for

**evidence that confirms skills
in:**

WA2201

**Obtaining relevant circuit
diagrams, schematics,
manuals**

WA2202

**Isolating, tagging and
verifying isolated equipment**

WA2203

Removing and refitting sub

**=
assembly/equipment from
the system**

WA2204

**Carrying out
modifications to specification**

WA2205

**Amending circuit diagrams,
schematics, equipment
manuals, specifications
affected by the modifications**

WA2206

**Recommissioning electronic
equipment**

WA2207

**Testing, checking modified
electronic equipment to**

**ensure conformance to
specifications**

WA2208

**Entering routine and familiar
information onto pro**

**=
forma and standard workplace
forms**

WA2209

**Locating, reading and
interpreting information on
written job instructions,
specifications, drawings,
charts,
lists and other reference
documentation**

WE23

**Maintain, repair control
instrumentation**

**=
single
and multiple loop control
systems**

Date

Signature

**90674: National N Diploma,
Engineering Studies:
Electrical Engineering
24**

**Look for evidence that
confirms skills in:**

WA2301

**Obtaining and interpreting
relevant engineering
specifications, technical
information, software data,
diagrams and drawings,
historical records and
documents pertaining to the
system components and
operational data**

WA2302

**Consulting system operators
and other relevant plant
personnel with respect to
the control loop
characteristics**

WA2303

Confirming function/malfunction of the system and/or its components

WA2304

Checking operational characteristics of control devices, signal conversion instruments and final control elements for conformance to specification

WA2305

Identifying faults/defects in control system components

WA2306

Locating/reading in

=

built fault indicators and error codes

WA2307

Obtaining relevant pneumatic, electrical and electronic circuit diagrams

WA2308

Testing and

Date

Signature

Look for evidence that confirms skills in:

WA1801

Obtaining relevant data with respect to the operation of the instrumentation systems/equipment

WA1802

Locating, inspecting and testing a range of instrumentation system components

WA1803

Isolating instrumentation system checking the drawing against job requirements/related

equipment in accordance with standard operating procedures

WA0202

Confirming the drawing version as being current in accordance with standard operating procedures

WA020

3

Where appropriate, obtaining the current version of

monitoring the control loop for correct operation

WA2309

Monitoring and recording responses of the control system

WA23

10

Using appropriate fault

=

finding and diagnostic techniques and procedures throughout the monitoring and testing process

WA23

11

Comparing collected data with the operational specifications of the control system

WA23

12

Marking components for repair or replacement find, test and calibrate instrumentation systems and equipment

the drawing in accordance with standard operating procedures

WA0204

Reading, interpreting information on the drawing, written job instructions, specifications, standard operating procedures, charts, lists and other applicable reference documents

WA0205

Checking and clarifying task related information

90674: National N Diploma, Engineering Studies: Electrical Engineering

6

WA0206

Undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

WE3

Terminate and connect electrical wiring

Date

Signature

Look for evidence that confirms skills in:

WA0301

Checking materials for conformance to specifications

WA0302

Checking existing and new installation site for correct location and specification

WA0303

Making terminations/connections to specification, manufacturer and regulatory requirements

WA0304

Adjusting and fixing wiring supports

WA0305

Marking, tagging and labelling cables, wires, conductors and connections

PURPOSE AND RATIONALE OF THE QUALIFICATION:

EXIT LEVEL OUTCOMES :

Continue assessment exercise

- ☐ .
- ☐ Develop entrepreneurial opportunities.
 - ☐ Understand and apply the SABS Code of Practice for Wiring Buildings.
 - ☐ Understand the difference between AC Motors, DC Machinery, the design of DC Machines, and the operation.
 - ☐ Application of management including Supervisory Management, Communication in Business, Principles of Management, Managing People.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Critical Cross-field Outcomes:

- ☐ Problems are solved by means of exploring and critically evaluating abstract and personal situations.
- ☐ Problems are solved by generating alternative strategies for dealing with those problems.
- ☐ Collaborative work as part of a team, group, organisation or community is effective.
- ☐ Organisation and management of self and activities is responsible and effective.

Installer design analyze find fault component

Working subject module assignment assessment moderation
articulation : t

trade and foundation phase ,

Workshop la engineering technical , and military engineering security
engineering

-Purpose subject module basic rule , fundamental , level topic
theoretical experimental, practical career objectivity practical meet
requirement explanation subject assessment n , assessment institute
saqa foreign n moderator

-Requirement subject module

Explain

-Construction subject module

-Task subject module schedule

-Step subject

-Operation subject :

Activity :

Phase step module week frame all

-Assignment example assessment

Outcome technology

-Research project / analyze label

Scaling weighting frame work

Tools assessment formative summative

Peer self

Workshop la engineering technical , and military engineering security engineering

-Purpose subject module basic rule , fundamental , level topic
theoretical experimental, practical career objectivity practical meet
requirement explanation subject assessment n , assessment ,
☐ ineering electrical n diplomat

-Requirement subject module

Explain

-Construction subject module

-Task subject module schedule

-Step subject

-Operation subject :

Activity :

Phase step module week frame all

-Assignment example assessment

Outcome technology

-Research project / analyze label

Scaling weighting frame work

Tools assessment formative
summative

Peer self

Qualification phase award

N criteria tools assessment ,
minimum ,maxim score

Mark ,memo

[PDF] Curriculum Document -
EWSeta

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This qualification reflects the role of a skilled person working in Civil construction and maintenance, who applies a broad range of skills in a varied work ...

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Interpret the construction drawings, specifications and programme; Plan and prepare for civil construction work; Set out and transfer levels

More than nine out of 10 workplace accidents are due to human error. These result in serious injuries and cost the industry billions of dollars every year. Yet much of this could be avoided with better, clearer work instructions. This guide will show you how to write work instructions – or Standard Operating Procedures.

[social_warfare]

Knowing how to write work instructions or SOPs, clearly and concisely for your colleagues ensures they know exactly how their various tasks should be

performed. It reduces risk because the likelihood of things going wrong is lessened. It also improves efficiency; work instructions ensure the very best way of doing a job is clear and known to the people doing it.

This comprehensive guide will show you how to write work instructions that your colleagues can understand and benefit from. Remember what Einstein said:

[alert heading="Albert Einstein" type="alert-info" block="true" close="false"]If you can't explain it **simply**, you don't understand it well enough. [/alert]

Speaking of simplicity: If you're the type to learn things easier through a visual or audible format, check out our video below about where work instructions started and why they matter:

[Work Instructions or SOPs - Why They Help](#)

(we hope this video can arm you with good arguments to why this area is important.)

What's the difference between work instructions, work guides, SOPs and so on?

Work instructions are also called work guides, Standard Operating Procedures (SOPs), job aids or user manuals, depending on the situation. In any case, the purpose of the work instructions

is to clearly explain how a particular work task is performed. They're like the step-by-step instructions we receive when we learn to drive a car: check gear stick is in neutral, start ignition, press clutch, change to first gear and so forth.

What's important is that work instructions should not be confused with processes or process maps. Let's quickly look at where work instructions fit into our overall process documentation levels:

1. A **process hierarchy** shows your overall process architecture and how it supports your business. (For more on this read our [Guide to creating process hierarchies](#))
2. A **process** is a chain of activities that transform inputs to outputs. (Interested? read our [Guide to simple process mapping](#))
3. A **procedure** outlines *how* to perform a process – sequence and who does what. In Gluu we combine process and procedure into a single, simple format (since people confuse them all the time).
4. A **work instruction** – or work guide, job aid or standard operating procedure – describes in detail how an activity within a process (or procedure) is performed.

Your work instruction should therefore be part of an overall [process improvement plan](#).

With this clarity let's move on to the topic of how to write work instructions. (Oh, one more thing: For clarity on all the BPM lingo see our [BPM Glossary](#))

Why are Standard Operating Procedures important?

They reduce the impact when key people leave

Work instructions, or SOPs, build and preserve the knowledge inside a company. When “how things are done” are passed on verbally, there is room for interpretation and human error. And knowledge about how to most efficiently perform a task is lost when said employee leaves the company and takes the knowledge with them. Good work instructions avoid all this.

Work instructions reduce risk

They reduce risk because the safest way of doing a job is clear and known by the people that matter.

Avoid errors and “the blame game”

Clarity avoids errors. Crucially, this avoids the blame game. When things go wrong the tendency is to blame or hold people responsible, which is natural. But if this happens often it can have an impact on staff morale. Having clear work instructions minimises this problem.

Save time

The chart below shows Gluu's own research on the Return on Investment when writing work instructions. The point is that your initial investment in time is paid back once your work instruction has been used just three times. This only refers to time-saving – we haven't even mentioned the value of avoiding errors and rework. This is also referred to as "Standard Work" within Lean:

Inspection and Testing

Inspection is an organized examination or formal evaluation exercise. In production, it involves the measurements, tests, measuring gauges and test equipments applied to certain characteristics in regard to a material or a product. The results are normally compared to the specified requirements and standards for determining whether the material or the product is in line with these targets. Some inspection and testing methods are destructive. However, inspections are normally non-destructive.

Inspection and testing activity is a systematic and independent

assessment activity in the organization. This activity provides timely, credible, and useful information. The inspection and testing function of the organization is important for the success of the organization. Some organizations make a distinction between inspection and testing work. The organization needs to have written approved procedures for the inspecting and testing activities to ensure that the inspection and testing activity complies with the quality standards as well as the legislation, regulation, as well as the applicable standards.

Every organization is required to have inspection and testing

procedures. The purpose of these procedures is to establish and define the process for inspection and testing and activities which verify the material or product conformance, and to verify that process inputs and outputs conform to specified requirements. Documented records and information of inspection and testing include evidence of conformity with the acceptance criteria and traceability to the person who has carried out inspection and testing of the material or product. Records of inspection and testing are to be maintained.

Inspection and testing at different production stages allows for early detection of faults. The earlier a defect is found in the production process, the less expensive it is to fix the defect. Defects are to be corrected so that yields at the inspection and testing stage can improve. Inspection system can be visual, or radiography based. Several inspection systems are automated. Automated inspection systems can be (i) sensor based, (ii) instrument based, or (iii) optical based.

activity map for inspection and testing

For the inspection and testing personnel who are to perform the inspections and the tests, it is to be ensured that the individuals, who performs an inspection and testing activity to verify conformance of an item to specified acceptance criteria, are qualified. Further, it is to be ensured that the inspection and test

Terminology used for inspection and testing

Inspection – It is the activity such as witnessing the measurement, examination, testing or gauging of one or more characteristics

Accuracy – It is the degree of conformity of a measured or calculated value to its actual or specified value. Also, accuracy is the ‘correctness’ of a measurement, that is, how closely it matches the value being measured. The term ‘precision’ is not to be used for ‘accuracy’. As an example, if there are two screw gauges ‘A’ and ‘B’ used for measuring the diameter of a wire rod having diameter of 6.56678 millimetres (mm). Screw gauge ‘A’ can only display a reading of 6.56 mm, while screw gauge ‘B’ can display a reading of 6.49969 mm. Screw gauge ‘A’ is accurate (its measurement is more correct), but not precise while screw gauge ‘B’ is precise (more detailed), but not accurate.
Measurement – Measurement is a comparison to a standard.

Metrology – Metrology is the science and process of ensuring

that a measurement meets specified degrees of both accuracy and precision. Metrology, then, is the process by which both accuracy and precision are tested and adjusted for (if necessary).

Standard – It is the testing of accuracy and precision of measuring device is made through a hierarchical system where each measuring device is compared against an external reference known as a 'standard'. Each 'standard' is then tested against a higher level (more accurate and precise) 'standard', which is compared against an even higher 'standard', and so on.

Calibration – The process of comparison against a 'standard' and making the necessary adjustments is normally called calibration. Detailed records are maintained for each item which is calibrated to ensure 'traceability', and that the item meets clearly identified specifications for both accuracy and precision in all its operating parameters. Calibration refers to the process of setting the magnitude of the output (or response) of a measuring instrument to the magnitude of the input property or attribute within specified accuracy and precision.

Tolerance – Tolerance is an allowance, given as a permissible range, in the nominal dimension or value specification of a manufactured item. The purpose of a tolerance is to specify the allowed leeway for imperfections

in the production of the part or component. The tolerance can be specified as a factor or percentage of the nominal value, or a maximum deviation from a nominal value, or an explicit range of allowed values, or be specified by a note or published standard with this information, or be implied by the numeric accuracy of the nominal value. Tolerance can be symmetrical, as in 40 mm \pm 0.1 mm, or asymmetrical, such as 40 mm + 0.2 mm / -0.1 mm.

Uncertainty (of measurement) – It is the result of the evaluation aimed at characterizing the range within which the true value of a measurement and is estimated to lie, normally with a given likelihood.

Measuring equipment – It consists of all of the measuring instruments, measurement standards, reference

During the planning for inspection the important things which are to be considered are (i) place of inspection, (ii) time of inspection, (iii) method of inspection, (iv) degree of inspection, (v) parameters of inspection, (vi) implements to be used for inspection, and (vii) qualification and experience of the quality control person to carry out the inspection.

The first thing of the inspection activity is to decide what parameters are to be checked or inspected during the inspection. The parameter can be different for different kinds of materials. So, the quality control person

carrying out the inspection is to know clearly about the parameters which are to be checked e.g., diameter, and length etc. These make the variation to be studied in case of statistical analysis.

For the time of inspection of the product / material, there is no hard and fast rule. The practices which are normally followed are (i) inspection is done at each halt during production process, and (ii) inspection is done after each operation in the process. These practices help in fixing the responsibility for any defective work. This also helps in knowing where the quality is respectively not being followed.

The inspection activities are to be documented and controlled by written and approved instructions, procedures, drawings, check-lists, or other appropriate means. The documents for inspection include (i) identification of each work operation where inspection is necessary to ensure quality, (ii) identification of documents which are to be used to perform the inspections, and (iii) identification of the characteristics for inspection and the identification of when, during the work process, inspections are to be performed for those characteristics, (iv) identification of inspection or process-monitoring methods employed, (v) sufficient information from the final inspection, to provide a conclusion regarding conformance of the item to specified requirements, (vi) identification of the functional-

qualification level (category or class) of personnel performing inspections, (vii) identification of acceptance criteria, (viii) identification of sampling requirements, (ix) methods to record inspection results, (x) selection and identification of the 'measuring and test equipment' to be used to perform the inspection.

Sampling

Sampling in quality control is used for quality assurance. Quality assurance which relies primarily on inspection after production is called acceptance sampling. Acceptance sampling involves testing a random sample of items from a lot and deciding whether to accept or reject the entire lot based on the quality of the random sample. Quality assurance efforts which occur during production include statistical process control. Statistical process control involves testing a random sample of output from a process to determine whether the process is producing items within a pre-determined acceptable range.

Sampling is done by quality control personnel. The skills and knowledge of the quality control personnel are to be sufficient to provide a sound basis for their work, and to adopt an informed approach to applying the required quality sampling procedures. Further, quality control personnel are to be familiar with the safety precautions needed when working with the manufacturing equipment and when taking and

testing the required samples. They are required to demonstrate safe working practices throughout the process of sampling. The process of sampling for confirming quality of materials under production involves (i) gathering samples at the appropriate level of frequency, and (ii) preparing the samples for inspection and testing.

Sampling is perhaps the most important step in the quality assessment of the material being inspected. Since a sample is just a small portion of the total material, the importance that the sample is representative of the material being inspected cannot be over-emphasized. Any test performed on the sample, regardless of how carefully and accurately performed, is worthless unless the sample is truly representative of the material being inspected.

Acceptance sampling is a statistical measure used in quality control. It allows the organization to determine the quality of a batch of products by selecting a specified number for testing. The quality of this designated sample is viewed as the quality level for the entire group of products.

Visual inspection and testing

Visual inspection - It provides a means of detecting and examining a variety of surface flaws, such as corrosion, contamination, surface finish, and surface discontinuities on joints (for example, welds, seals, and

solder connections). Visual inspection is also the most widely used method for detecting and examining surface cracks which are particularly important because of their relationship to structural failure mechanisms. Even when other inspection techniques are used to detect surface cracks, visual inspection frequently provides a useful supplement. For example, when the eddy current examination of process tubing is performed, visual inspection is frequently performed to verify and more closely examine the surface disturbance. In some cases, acid etching (macro-etching) can be used to reveal structures which are not visible to the naked eye, such as flow lines in Fig 2. The figure shows flow lines in closed die forged AISI 4140 (UNS G41400) alloy steel grade steering knuckle revealed by cold deep acid etching with 10 % aqueous HNO₃ (0.5 ×) and enhanced with inking.

Mount and wire control panel equipment (Release 1)

Summary

Usage recommendation:
Current
Mapping:

Mapping

Supersedes and is
equivalentMount and
wire control panel
equipment

Release Status:
Current
Releases:

Release
1 1 (this

Not Dat
es e

Release
release)

Companion volumes:
Unit of competency

- [Companion Volume implementation guides are found in VETNet -](#)

Assessment requirements

- [Companion Volume implementation guides are found in VETNet -](#)

Delivery:

[Find RTOs approved to deliver this unit of competency.](#)

Training packages that include this unit

CodeSort Table listing Training packages that include this unit by the Code column	TitleSort Table listing Training packages that include this unit by the Title column	Release
UEE - Electrotechnology Training Package	Electrotechnology Training Package	2.0-6.0

Qualifications that include this unit

CodeSort Table listing Qualifications that include this unit by the Code column	TitleSort Table listing Qualifications that include this unit by the Title column	Usage Recommendation	Release
Diploma of Electrical Systems Engineering	Diploma of Electrical Systems Engineering	Current	
Certificate in Electrotechnology - Systems Electrician	Certificate IV in Electrotechnology - Systems Electrician	Current	
Certificate in Electrical Equipment and Systems	Certificate in Electrical Equipment and Systems	Current	
Certificate in Switchgear and Controlgear	Certificate in Switchgear and Controlgear	Current	

Advanced Diploma of Electrical - Engineering	Advanced Diploma of Electrical - Engineering	Current	
Diploma of Electrical Engineering	Diploma of Electrical Engineering	Current	
Advanced Diploma of Electrical Systems Engineering	Advanced Diploma of Electrical Systems Engineering	Current	
Certificate in Electrotechnology Electrician	Certificate in Electrotechnology Electrician	Current	
- Certificate in Electrical Fitting	Certificate in Electrical Fitting	Current	
Refresh information in 'Table listing Qualifications that include this unit' Navigate to first page in table listing Qualifications that include this unit. Navigate to previous page in table listing Qualifications that include this unit. Navigate to page 1 in table listing Qualifications that include this unit Navigate to the next page in table listing Qualifications that include this unit. Navigate to the last page in table listing Qualifications that include this unit. Items per page Displaying it			

Classifications

☐ [Display history](#)

Scheme	Code	Classification value
Module/Unit of Competency Field of Education Identifier		Electrical Fitting, Electrical Mechanics

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Content

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Unit of competency**This unit involves the skills and knowledge****Modification History****It includes working safely, following layout, installing and terminating wiring, function****Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Package.****No licensing, legislative or certification requirements****Application****Pre-requisite Unit**

Apply work health and safety regulations, codes and practices in the workplace

Fabricate, assemble and dismantle utilities industry components

Fix and secure electrotechnology equipment

Use drawings, diagrams, schedules, standards, codes and specifications

Arrange circuits, control and protection for general electrical installations

Solve problems in low voltage a.c. circuits

Terminate cables, cords and accessories for low voltage circuits Develop and connect

Solve problems in direct current (d.c.) machines

Solve problems in magnetic and electromagnetic devices

Solve problems in alternating current (a.c.) rotating machines

test and connect transformers

and

Solve problems in direct current circuits

or

Solve problems in multiple path circuits

Solve problems in single path circuits

Competency Field**Assembly****Unit Sector****Electrotechnology**

Elements and Performance Criteria

ELEMENTS		PERFORMANCE CRITERIA	
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Plan to mount and wire control panel equipment	1.1	Wire control panel equipment installation is determined and planned in accordance with job specifications, wiring and schematic diagrams
		1.2	Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are identified and applied
		1.3	Work instructions, including layout and wiring diagrams, are applied in accordance with workplace procedures
		1.4	Advice is sought from supervisor to ensure work is coordinated effectively with others
		1.5	Materials required for the control panel work are obtained in accordance with workplace procedures
		1.6	Tools, equipment and measuring devices required to carry out control panel work are obtained and checked for safety in accordance with workplace procedures
2	Mount and wire control panel equipment	2.1	Control panel equipment and electrical hazards are identified, risks assessed and control measures implemented
		2.2	Circuits are checked and isolated in accordance with WHS/OHS workplace requirements and procedures
		2.	Components are laid out in accordance with

		3	job specifications, wiring and schematic diagrams
		2.4	Control panel components including switch gear, interconnecting plugs and sockets and earthing are fitted in accordance with work instructions, industry standards, manufacturer specifications and workplace procedures
		2.5	Control panel wiring is installed in accordance with wiring and schematic diagrams, work instructions, industry standards, manufacturer specifications and workplace procedures
		2.6	Regular quality checks are carried out in accordance with workplace procedures
		2.7	Completed control panel is visually inspected and tested in accordance with workplace procedures, industry standards and manufacturer specifications
		2.8	Labelling and cable numbering are undertaken in accordance with industry standards, wiring and schematic diagrams
		2.9	Unplanned events are referred to supervisor for directions in accordance with workplace procedures
		2.10	Work is carried out without waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy practices
3	Finalise and inspect control panel installation	3.1	Assembled control panel is tested against work instructions, industry standards and manufacturer specifications in accordance with workplace procedures
		3.2	Problem-solving techniques are used, where corrective actions to assembled

			components are required, in accordance with regulatory requirements and industry standards
		3.3	Work completion is documented and relevant person/s notified in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables of the environment.

Non-essential conditions may be found in the Electrotechnology Training Package Implementation Guide.

Assembling must include at least two different control panels including the following:

- **controls for more than one electro-mechanical assembly and devices such as relays, controllers, indicator lights, push buttons**

Unit Mapping Information

This unit replaces and is equivalent to Mount and wire control panel equipment

Assessment requirements

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the elements, performance criteria and range of conditions on at least two separate occasions.

- applying labelling and numbering to cables and using terminal numbering in accordance with industry standards and workplace procedures
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices
- dealing with unplanned events in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- following layout and wiring diagrams
- inspecting and checking installation of control panel equipment
- laying out components, including:
 - selecting and placing switchgear and control gear in accordance with industry standards, wiring and schematic diagrams, including low voltage (LV) and extra-low voltage
 - segregating of cables at different voltages in accordance with relevant industry standards
 - interconnecting plugs and sockets
- mounting and wiring control panel equipment in accordance with relevant industry standards
- selecting switchgear and control gear to required specifications, including voltage ratings, current ratings and overload settings
- using problem-solving techniques when determining the nature of a fault.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the elements, performance criteria and range of conditions and include knowledge of:

- control panel types and mounting techniques, including:
 - clearances
 - DIN mounted switchgear
 - direct mounting on insulated panels
 - metallic and non-metallic (insulated)
 - rear connections
 - strapped harness wiring and use of duct to support and channel wiring
- cable labelling and numbering, including:
 - cable and component labelling/identification
 - use of terminal strips to assist fault finding
- component layout, including:
 - interconnecting plugs and sockets
 - placement/layout of power and control circuit devices and components
 - segregation of cables at different voltages
 - wiring and schematic diagrams
- choice of switchgear and control gear, including:
 - current ratings
 - number of operations
 - overload and fuse settings
 - voltage ratings
- other considerations, including:
 - earthing of panels
 - effect of high current devices on electromagnetic components or programmable
 - effects of electronic components on other devices
 - size of power and control circuit conductors
- relevant industry standards
- problem solving techniques including quality checks
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- risk mitigation processes.

Assessment Conditions

Assessors must hold credentials specified within the Training Package Developers, the Standards for Registered Training Organisations current at the time of assessment, and the Standards for Assessment current at the time of assessment. • State and Territory Government Training Departments

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements

included within the Standards for Registered Training Organisations current at the time of assessment. What is claimed is:

Assessment must occur in workplace operational situations where it is appropriate to do so, where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operational procedures
- the replacement component to be bonded to the electrical contacts of the support.

Reports

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- [Taxonomy reports](#)
- [Training package reports](#)

Resources

- [Australian Government Bodies](#)

1. A method of replacing a defective electronic component having a plurality of electrical leads bonded to electrical contacts of a support comprising,

cutting the electrical leads adjacent the bonds of the leads to the contacts leaving a stub bonded to each contact,

rebonding the stubs to the contacts,

replacing the defective

component with a replacement

electronic component having

electrical leads and

currently used in industry

bonding the electrical leads of

the replacement component to

the electrical contacts of the

support.

2. The method of claim 1 wherein the step of cutting the leads is performed simultaneously with the step of rebonding the stubs.

3. The method of claim 1 wherein the electrical leads of the replacement component are bonded to the tops of the stubs.

4. The method of claim 1 wherein the electrical leads of the replacement component are bonded to the contacts adjacent the stubs.

5. The method of claim 1 wherein the cutting of the electrical leads is substantially, but not entirely, through the leads for avoiding damaging the support.

6. The method of claim 1 wherein the bond between the electrical leads and the contacts is a gold-to-gold bond.

7. The method of claim 1 wherein the electrical leads are electrical leads of a TAB tape having the outer ends bonded to the contacts.

Description:

BACKGROUND OF THE INVENTION

The present invention is directed to a method of replacing a defective electronic component having a plurality of electrical leads which are bonded to electrical contacts of a support such as a single chip package, multi-chip substrates, printed circuit boards (PCBs), or tape-automated-bonded (TAB) tape carriers.

However, if the electrical component is defective, it must be replaced or it must be scrapped. In the case of a multi-chip substrate this requires scrapping the entire module which can be quite expensive. And in particular, certain hard

electrical contact bonds, such as gold-to-gold thermocompression and thermosonic bonds have generally been considered unrepairable because of the inability to remelt these bonds without damaging the underlying support. Attempts to remove these bonds by pulling them loose can result in uneven stub lengths or damage to the bonding pad. U.S. Pat. Nos. 4,567,643 and 4,806,503 disclose various methods for replacing a defective electronic component with a replacement.

The present invention is directed to an improved method of replacing a defective electronic component and is also directed to a bonding tool which is useful in a thermocompression or thermosonic bonding machine for assisting in the method.

SUMMARY

The present invention is directed to a method of replacing a defective component having a plurality of electrical leads bonded to electrical contacts of a support. The method includes cutting the electrical leads adjacent the bonds of the leads to the contacts leaving a stub bonded to each contact, and rebonding the stub to the contact. The method further includes replacing the defective component with a replacement electronic component having electrical leads and bonding the electrical leads of the replacement component to the electrical contacts of the support.

A still further object of the present invention is wherein the step of cutting the lead is performed simultaneously with the step of rebonding the stub.

Still a further object is wherein the electrical leads of the replacement component are bonded to the tops of the stubs.

A further object of the present invention is wherein the electrical leads of the replacement component are bonded to the contacts adjacent the stubs.

Another feature of the present invention is wherein the cutting of the electrical lead is substantially, but not entirely, through the lead for avoiding damaging the underlying support.

In particular, the present invention is useful for repairing bonds between electrical leads and contacts wherein the bonds are a gold-to-gold bond. The present invention is also applicable to the electrical leads of a TAB tape having the outer ends bonded to the contacts.

Another object of the present invention is the provision of a bonding tool for use in a thermocompression or thermosonic single point bonding machine for cutting an electrical lead from an electrical contact and bonding the remaining lead stub to the contact. The bonding tool includes a tip having a flat contacting end with at least one recess therein and a downwardly directed cutting edge connected

to the periphery of the end. Preferably, the cutting edge extends downwardly from the end a distance less than the thickness of the electrical leads.

Other and further objects, features and advantages will be apparent from the following description of presently preferred embodiments of the invention, given for the purpose of disclosure, and taken in conjunction with the accompanying drawing.

DESCRIPTION OF THE DRAWINGS

is a fragmentary, elevational view, in cross-section, illustrating the bonding of one lead of an electronic component to an electrical contact of a support,

is a view similar to illustrating the step of replacing a defective electronic component by cutting an electrical lead adjacent the bond site, but leaving bonded stub,

is a view similar to in which the defective electronic component and its cut leads have been removed leaving a bonded stub,

is a view similar to in which a replacement electronic component has replaced the defective component and its leads are being bonded adjacent the edge of the stub, and

is a view similar to showing another method of bonding the leads of the replacement component to the top of the stub.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and particularly to , an electronic component 10 such as a chip, having a plurality of electrical leads 12, only one of which is shown for convenience, which may be TAB tape leads. The inner ends 14 of the leads 12 are bonded to the component 10 and the outer leads 16 are to be bonded to electrical contacts such as pads or bumps 18 on a support 20 which may be a substrate, a single chip package, a multi-chip substrate, a PCB, or a TAB tape carrier. The outer end 16 of each lead 12 is bonded to a contact 18 by any suitable means such as a laser or by a thermocompression or thermosonic bonding tool 22 such as more fully described in U.S. Pat.

The above-described method of attaching an electronic component 12 and electrically connecting it to a support 20 is well known. However, the electronic component 10 may be defective and unless it can be replaced with a new component, an entire multi-chip package or completed assembly must be scrapped. However, in the past, where the bonds between the outer ends 16 of the leads 12 and the contacts 18 were a hard bond, such as a gold plated outer end 16 to a gold plated copper bond pad 18, such bonds were generally considered unrepairable because of the inability of remelting these bonds without damaging the support package or substrate 20. And any

attempt to remove the bonds between the leads 12 and the contacts 18 by pulling them loose can result in uneven stub lengths or damage to the bond contact 18.

Referring now to , a cutting and bonding tool 24 of the present invention is best seen having a flat contacting end 26 with at least one recess 28 therein such as described in U.S., and including a cutting edge 30 at the outer periphery of the end 26 of the tool 24. The recess 28 is preferred in thermosonic bonding to improve the transfer of ultrasonic energy to the bonding area, but is not an essential element of the present invention. The tool 24 is preferably a computer-controlled single point bonder since the present invention is best suited to cut and rebond one lead at a time. In any case, the tool 24 can be used in place of the bonding tool 22 in a conventional thermocompression or thermosonic bonder. The purpose of the cutting and bonding tool 24 is twofold. First, as best seen in 2 and 3, the cutting edge 30 cuts the outer leads 16 of the defective component 10 in front of the original bond site, that is, adjacent the bond between the leads 12 and contacts 18 which were made by the tool 22 as shown in . A preferred material for tool 24 is titanium carbide. As best seen in , cutting the leads 12 leaves a stub 32 bonded to the contact 18 but allows the removal of the defective component 10 and its attached and cut leads 12. As discussed, it is not feasible to remove the stubs 32 because of

the inability to remelt the bonds from the contacts 18 or remove the stubs 32 by pulling them from the contacts 18 without damaging the underlying support 20.

Therefore, the bonded stubs 32 are allowed to remain in place, as will be more fully described hereinafter, for bonding the leads of a new replacement electronic component to the contacts 18 in front of the stubs , or, bonding the outer leads of the replacement component on top of the stubs 32 . However, in either case, the integrity of the bond between the stubs 32 and the contacts 18 must be maintained. That is, even if the new leads 12a are bonded to the contact 18 in front of but not on the stub 32, the stub 32 could possibly become dislodged and short between other electrical members. And, of course, if as in . 5, the electrical leads 12b of the replacement component 10b were bonded on top of the stubs 32, it would be necessary that the stubs 32 be securely bonded to the contacts 18.

Referring again to . 2 and 3, the cutting and bonding tool 24 of the present invention not only cuts the electrical leads 12 of the defective electronic component 10, but the flat end 26 of the tool 24 also rebonds the stub 32 to the contact 18. This insures that the stub 32 will not become dislodged in the future and also insures that it makes a good electrical bond with the contact 18 if needed for the procedure of FIG. 5.

Therefore, in FIG. 4, each electrical lead 12a of the replacement component 10a may be bonded directly to an electrical contact 18 in front of or adjacent to the stub 32 by any suitable method of bonding such as a laser bonding or the tool 22 used in FIG. 1. Or as an alternative, as best seen in FIG. 5, the replacement component 10b may have each of its outer leads 12b bonded to the top of a stub 32 by any suitable method of bonding such as a laser or the bonding tool 22 previously used. Of course, using the procedure of FIG. 5, the replacement component 10b and its leads 12b may be identical in size to the original component 10 and its leads 12. However, in using the procedure of FIG. 4, it would be necessary that the contacts 18 on the support 18 have a sufficiently large footprint or size in order to provide bonding space on the contact 18 for the outer end 16a of the lead 12a and, if desired, the length of the electrical leads 12 a could be shortened. Thus, the procedure of FIG. 4 as compared with that of FIG. 5 will have greater reliability since the original interface between the lead 12 and the contact 18 is eliminated, but will also result in decreased packaging density of components 10 on support 20 due to the space allocated for the footprints.

Referring again to FIG. 2, it is to be noted that the cutting edge 30 extends downwardly from the periphery of the end 26 of the cutting and bonding tool 24 a distance of d. Preferably, the distance of d is a distance less

than the thickness of the electrical lead 12. That is, in order to avoid damage to the underlying support 20, the electrical leads 12 are cut substantially, but not entirely through the leads 12. Thereafter, the leads may be easily broken away without damaging the underlying support 20. This is generally accomplished where the extent of the cut can be approximately 90% of the thickness of lead 12. For instance, a cutting edge with a thickness d of 1 mil would be suitable for a lead 12 having a thickness of 1.3 mils.

The flat portion of the end 26 of the tool 24 also helps to control the depth of the cut and prevents the cutting edge from cutting through a lead 12 into the bond pad 18.

The present invention is well suited for cutting and rebonding hard metal bonds; in particular, gold-to-gold bonds such as gold plated copper leads to gold plated copper bond pads.

The present invention, therefore, is well adapted to carry out the objects and attain the ends and advantages mentioned as well as others inherent therein. While presently preferred embodiments of the invention have been given for the purpose of disclosure, numerous changes in the details of construction, arrangement of parts, and steps of the process, may be made without departing from the spirit of the invention and the scope of the appended claim

Introduction

Connectors are used to join subsections of circuits together. Usually, a connector is used where it may be desirable to disconnect the subsections at some future time: power inputs, peripheral connections, or boards which may need to be replaced.

Covered in This Tutorial

In this tutorial we will go over:

- Basic connector terminology
- Categorize connectors into distinguishable categories
- Talk about the differences between connectors within those categories.
- Show how to identify polarized connectors
- Talk about which connectors are best suited for certain applications

Suggested Reading

What is a Circuit?

Every electrical project starts with a circuit. Don't know what a circuit is? We're here to help.

Voltage, Current, Resistance, and Ohm's Law

Learn about Ohm's Law, one of the most fundamental equations in all electrical engineering.

How to Power a Project

A tutorial to help figure out the power requirements of your project.

Working with Wire

How to strip, crimp, and work with wire.

Polarity

An introduction to polarity in electronic components. Discover what polarity is, which parts have it, and how to identify it.
Connector Terminology

Before we get started discussing some commonly used connectors, let's explore the terminology used to describe connectors.

Gender

Gender - The gender of a connector refers to whether it plugs in or is plugged into and is typically male or female, respectively (kids, ask your parents for a more thorough explanation). Unfortunately, there are cases where a connector may be referred to as "male" when it would appear to be female; in the examples section, we'll point a few of those out as we discuss individual component types and explain why that's the case.

Male (left) and female 2.0mm PH series JST connectors. In this case, gender is determined by the individual conductor.

Polarity

Polarity - Most connectors can only be connected in one orientation. This trait is called polarity, and connectors which have some means to prevent them being connected wrong are said to be **polarized**, or sometimes **keyed**.

rel connectors provide only two connections, frequently referred to as "pin" or "tip" and "sleeve".

When ordering, there are three differentiating characteristics of a barrel connection- inner diameter (the diameter of the pin inside the jack), outer diameter (the diameter of the sleeve on the outside of the plug), and polarity (whether the sleeve voltage is higher or lower than the tip voltage).

Sleeve diameter is most commonly either 5.5mm or 3.5mm.

Pin diameter is contingent upon sleeve diameter; a 5.5mm sleeve will have either a 2.5mm or 2.1mm pin. Unfortunately, this means that a plug designed for a 2.5mm pin will fit in a 2.1mm jack, but that the connection will be, at best, intermittent. 3.5mm sleeve plugs usually mate to a jack with a 1.3mm pin.

Polarity is the final aspect to consider; most often, the sleeve will be considered 0V and the tip will be a positive voltage relative to the sleeve. Many devices will have a small diagram indicating the polarity expected by the device; care should be taken to adhere to this, as an improper power supply may damage the device.

Plugs of both sleeve sizes are usually 9.5mm long, but longer and shorter ones do exist. All SparkFun products use a negative 5.5mm sleeve and a positive 2.1mm pin; we recommend sticking to that standard where possible, as it seems to be the most common flavor found in the wild.

olex" Connectors

Most computer hard drives, optical drives, and other internal peripherals get power through what is typically called a "Molex" connector. To be more accurate, it's a Molex series 8981 connector--Molex is actually the name of the company which initially designed this connector back in the 1950s--but common usage has denuded that fact somewhat.

Molex connectors are designed to carry a lot of current: up to 11A per pin. For projects where a lot of power may be needed--a CNC machine, for instance, or a 3D printer- a very common method for powering the project is to use a desktop PC power supply and connecting the various system circuits through Molex connectors.

The Molex connector is one where the male/female terminology is a bit odd. The female connector is usually found on the end of a cable, and it slips inside of a plastic shell which surrounds the male pins on the male connector. Usually, the connectors are press-fit only, and very, very tight--they are intended to be connected and disconnected only a few times and, as such, are a bad choice for systems where connections will frequently be changed

C13 female IEC power connector, on a fairly standard [AC power supply cable](#). Cables with this end can be found all around the world, usually with the dominant local AC connector at the other end.

IEC connectors are used almost exclusively for AC power input. The nice thing about using one on a project is that IEC-to-wall cables are extremely common and available with localized wall plugs for most international locations!

JST Connector

At SparkFun, we frequently refer to "2.0mm JST Connectors". This is yet another generalization of a specific product- JST is a Japanese company which makes high-quality connectors, and our 2.0mm JST connector of choice is the PH series two-position polarized connector.

All of SparkFun's single-cell lithium-polymer ion batteries come standard with this type of JST connector, and many of our boards include this connector (or a footprint for it) as a power supply input. It has the advantage of being compact, durable, and difficult to connect backwards. Another feature, which can be an advantage or a disadvantage, depending on how you look at it, is that the JST connector is wicked hard to disconnect (although a [carefully applied diagonal cutter](#) can be helpful!) once it's mated. While this makes it unlikely to fail during use, it also means that disconnecting the battery for

charging can damage the battery connector.

-sub Type Connectors

Named for the shape of their shell, D-subminiature connectors are a classic standard in the computing world. There are four

very common varieties of this connector: DA-15, DB-25, DE-15, and DE-9. The pin number indicates the number of connections provided, and the letter combination indicates the size of the shell. Thus, DE-15 and DE-9 have the same shell size, but a different number of connections.

[Introduction Connector Terminology USB Connectors Audio Connectors Power Connectors SMA Antenna Connectors Pin Header Connectors Temporary Connectors Other Connectors Resources and Going F4586252](#)

US Patent References:

<u>Device for dismounting integrated circuit devices</u>			
<u>Desoldering device</u>			
<u>Cryogenic chip removal technique</u>			
<u>APPARATUS FOR REMOVING AND REPLACING MULTI-PINNED COMPONENTS MOUNTED ON CIRCUIT BOARDS</u>	<u>1</u>		
<u>Apparatus for removing electrical components from a circuit board</u>			

The basic concept of desoldering is very simple: you need to heat up the solder, then you need to figure out how to get the component or wires out nicely, and then you need to clean up all the solder still attached to the board and/or the component. In this guide you'll learn many of the diverse methods used to desolder through-hole components, from the nice, clean techniques to the last resort, end of the world schemes to get your desperately needed components back. If you have any other desoldering meStep

1: How to Use a Soldering Iron to Desolder

If all you have is a soldering iron, then your only option is to heat up the solder and fiddle with it until you can get the components out. Here's what you can do:

1. Heat up the solder with the iron.

2. Slide the iron up the pins to bring the majority of the solder away from the joint.

2. Using pliers, gently pull at the components to remove their pins from the pin holes while they are still hot. It's a good idea to pull by their leads as opposed to on the components themselves to

maintain the quality of the component.

Tip (edit): If you need to get excess solder out of holes, try sticking something like a safety pin or needle through to clear out the through-holes. Using the tip of the soldering iron will remove the copper plating from the PCB.

Pros: You need nothing but a soldering iron, and the components can be reused.

Cons: You may damage the board if you leave the soldering iron on it for too long.

Step 2: How to Use Desoldering Braid

Desoldering braid, or solder wick, is a nice desoldering method used to essentially soak up unwanted solder. It comes in a coil of braided together strands of wire. Because copper conducts heat well, and solder is attracted to heat, by heating up the braid you can draw the solder off your part and into the braid. Some desoldering braid comes with flux within it, which makes it much easier and cleaner to remove a part. If your soldering braid does not contain flux, then you can apply it by dipping the section of the braid you will use into the flux. Here's how to use it:

1. Unwind a few inches of braid from the coil.

2. If your solder wick does not have flux on it, it would be a good idea to add flux to the section you are going to use to make for a clean removal.

3. Place the braid over the joint you want to rework.

4. Place a hot soldering iron against the braid and desired pin.

5. Wait a few seconds. The solder will flow off the pin and onto the braid.

6. Remove the braid. The braid will be very hot at this point, so make sure not to touch the braid itself, only the spool.

7. Remove the component.

8. Repeat steps 1-5 to remove excess solder.

Tip: Use a pair of needle-nose pliers to position and hold down the braid without getting burned.

Pros: It's cheap and easy to use, and comes in various sizes depending on the magnitude of the solder you want to remove. Desoldering braid is great for removing solder from flat surfaces. Removed components can be reused.

Cons: Desoldering braid isn't reusable, you'll want to start with a clean segment of braid each time you use it. Because it gets so hot, it can be tough to reposition once you've started. It's also pretty hard to get solder out of pin holes.

Step 3: How to Use a Desoldering Pump

One of the nicest ways to desolder a component involves using a desoldering pump. A desoldering pump is essentially a

small, high pressure vacuum.
After heating up the solder, you
can use the desoldering pump to
suck the solder up and out of the
way. Here are the basic steps for
using a hand-powered
desoldering pump:

1. Heat up the solder you want to
remove with a soldering iron
(some desoldering pumps also
come with attached irons).

2. Press down on the plunger (If
your pump has a bulb, just
squeeze the bulb).

3. Once the solder is molten,
place the tip of the desoldering
pump against the solder that you
want to remove.

4. Release the plunger or bulb.
Some desoldering pumps have a
release button so that you don't
have to hold it the whole time.

5. Remove free component.

6. Repeat steps 1-4 to remove any
excess solder.

7. Dispose of the solder inside the
pump by repeatedly pressing
down and releasing the plunger.

Tip: If you are trying to remove
excess bits of solder, you may
want to add more solder to the
joint, because the solder will stay
liquid for longer when in larger
"blobs", and thus be easier to
remove.

Pros: Desoldering pumps come
in a wide range of styles, from
handheld pumps to electronic,
heated guns that require no iron
to use. They are great for

reworking small parts and
getting solder out of pin holes.
Removed components can be
reused.

Cons: Although the pumps can
have small tips, they are

NIT TITLE:APPLY QUALITY
STANDARDSUNIT

CODE:ELC315202UNIT

DESCRIPTOR:This unit covers
the knowledge, skills, (and)
attitudes and values needed to
apply quality standards in the
workplace.The unit also includes
the application of relevant
safetyprocedures and
regulations, organization
procedures andcustomer
requirementsELEMENTPERFOR
MANCE CRITERIAItalicized
Boldterms are elaborated in the
Rangeof Variables1.Assess
quality of received materials or
components1.1.Work instructions
are obtained and work is carried
out in accordance with standard
operating
procedures1.2.Received
materials or component partsare
checked against workplace
standards and
specifications1.3.Faulty material
or components related to work
are identified and
isolated1.4.Faultsand any
identified causes are recorded
and/or reported to the supervisor
concerned in accordance with
workplace procedures1.5.Faulty
materials or components are

replaced in accordance with workplace procedures
 2. Assess own work
 2.1. Documentation relative to quality within the company is identified and used
 2.2. Completed work is checked against workplace standards relevant to the task undertaken
 2.3. Faulty pieces are identified and isolated
 2.4. Information on the quality and other indicators of production performance is recorded in accordance with workplace procedures
 2.5. Deviations from specified quality standards, causes are documented and reported in accordance with the workplace' standards operating procedures
 3. Engage in quality improvement
 3.1. Process improvement procedures are participated in relation to workplace assignment
 3.2. Work is carried out in accordance with process improvement procedures
 3.3. Performance of operation or quality of product or service to ensure customers satisfaction
 Interpret technical drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit covers interpreting technical drawing applying to any of the full range of engineering disciplines.
 Application of the Unit
 Application of the unit
 Technical drawings may utilise perspective, exploded

views or hidden view techniques.
 Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines.
 Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries.
 Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Uni(Organise and communicate information).
 Band

:

A

Unit Weight

:

4

Licensing/Regulatory Information
 Not Applicable
 Interpret technical drawing

Date this document was generated:

Requisites

Prerequisite units

Employability Skills Information

Employability skills

This unit contains employability skills.

Elements and Performance

Criteria Pre

-

Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to

demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide. Interpret technical drawing Date this document was generated:

27 May 2012

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Manufacturing Skills Australia Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1.

Select correct technical drawing

1.1.

Drawing is checked and validated against job requirements or equipment.

1.2.

Drawing version is checked and validated.

2.

Interpret technical drawing

2.1.

Components, assemblies or objects are recognised as required.

2.2.

Dimensions are identified as appropriate to field of employment.

2.3.

Instructions are identified and followed as required.

2.4.

Material requirements are identified as required.

2.5.

Symbols are recognised in the drawing as appropriate.

Required Skills and Knowledge
REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

•

checking the drawing against job requirements/related equipment in accordance with standard operating procedures

•

confirming the drawing version as being current in accordance with standard operating procedures

•

where appropriate, obtaining the current version of the drawing in accordance with standard operating procedures

•

reading, interpreting information on the drawing, written job instructions, specifications, standard operating procedures, charts, lists and other applicable reference documents

•

checking and clarifying task related information

•

undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

•

application in accordance with
standards

operating procedures

- relationship between the views
contained in the drawing

Date this document was
generated:

Manufacturing Skills Australia
REQUIRED SKILLS AND
KNOWLEDGE

- objects represented in the
drawing
- units of measurement used in the
preparation of the drawing
- dimensions of the key features of
the objects depicted in the
drawing

- understanding of the instructions
contained in the drawing

- the actions to be undertaken in
response to those instructions

- the materials from which the
object(s) are made

- any symbols used in the drawing
as described in range statement

- hazard and control measures
associated with
interpreting technical drawings,
including housekeeping

- safe work practices and
procedures

MEM09002B Interpret technical
drawing

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27 May 2012

Approved

Page

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of

8

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Manufacturing Skills Australia
Evidence Guide

EVIDENCE GUIDE

T

he evidence guide provides
advice on assessment and must
be read in conjunction with the
performance criteria, required
skills and knowledge, range
statement and the Assessment
Guidelines for the Training
Package.

Overview of assessment

A person who demonstrates
competency in this unit must
be able to interpret technical
drawings as described.

Critical aspects for assessment
and
evidence required to demonstrate
competency in this unit

Assessors must be satisfied that
the candidate can

c

ompetently and consistently
perform all elements of the
unit as specified by the criteria,
including required
knowledge, and be capable of
applying the competency
in new and different situations
and contexts.

Context of and specific resources
for

assessment

nt

This unit may be assessed on the
job, off the job or a
combination of both on and off
the job. Where

assessment occurs off the job,
that is the candidate is not
in productive work, then an
appropriate simulation must
be used where the range of
condition

s reflects realistic

workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioni

ng. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any rele

vant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. Guidance information for assessment

Interpret technical drawing

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Manufacturing Skills Australia Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Bold italicised

wording, if used in the performance criteria, is detailed below. Essential operating con

ditions that may be present with training and assessment

(depending on the work situation, needs of the candidate, accessibility of the item, and local industry and

regional contexts) may also be included.

Interpret technical drawing

AS1100.101 is an extensive work and the candidate is not required to have complete

familiarity with all its contents, the application of

AS1100 would usually be in line with standard

operating procedures;

interpretation may require

guidance particularly in respect to any geom

etric

tolerancing

Unit Sector(s)

Unit sector

Co

=

requisite unit

STANDARD OPERATING

PROCEDURE

Title: Document Control and Change Procedure

Effective Date: _____

Approvals:
(sign and date)

Responsible Department Head
Technical Authority
QA/QC

1. PURPOSE

1.1
To describe the procedure for creation, review and approval of all product and manufacturing related documents (including, but not limited to all documents that pertain to the purchase, manufacture, testing, storage and handling of product).

1.2
To describe the procedure for filing, distribution and archiving of manufacturing related documents and other documents to which change control applies.

1.3
To describe the procedure for document change control.

2. SCOPE

2.1
This procedure applies to all manufacturing related documents which comprise the Device Master Record (DMR) including:
- Product Number Specifications (PNS)
- Manufacturing Batch Records (MBR)
- Standard Operating Procedures (SOP)
- Product Drawings (DWG)
- Qualification and Validation Documents (QVD)

2.2

Documents which impact European operations are covered by this procedure. The special handling (review and approval) procedures are detailed in section 10.0.

2.3

The general principles of document change control as outlined in this SOP are also applicable to Drawings (DWG). However, the generation, change control, archiving procedures specific for Drawings are explained in Section 11.0, because of the numerous exceptions involved.

2.4

This procedure applies to all non-manufacturing related Standard Operating Procedures which may be required to comply with regulatory requirements which impact the company's operations (as stated in the Quality Manual).

2.5

At the discretion of the generating department, this procedure may apply to any other company procedures which may be deemed appropriate to control under the system described in this procedure. However, the Director of QA/QC will ultimately determine the appropriateness of other company procedures which may be outside of the intended scope of this procedure.

2.6

Significant document changes (defined as changes to manufacturing or testing process or to product

form, fit or function) must be reviewed and approved before the change can be instituted. Discrepancy reports must be used for exceptions.
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3. RESPONSIBILITY

3.1
Originator
is responsible for:

3.1.1
Writing documents or document revisions.

3.1.2
Obtaining a DCO number prior to DCR routing to assure that the document is not being revised by another employee.

3.1.3
Determining what other documents might be impacted by the proposed change and initiating changes to affected related documents.

3.1.4
Obtaining and resolving the comments of the draft document reviewers.

3.1.5
Alerting all affected departments of changes planned to controlled documents.

3.2
Document Control
is responsible for:

3.2.1
Assigning DCO nu
checking the DCO
that documents en
DCR/DCO process
already in the cha
system.

3.2.2

Controlling the final review and approval routing of documents (DCO review).

3.2.3

Maintaining the Master Document Files (MDF).

3.2.4

Maintaining the Authorized Document Manuals (ADM).

3.3

Reviewers
are responsible for:

3.3.1

Assuring the accuracy, technical content and completeness of the document.

3.3.2

Returning any DCR that does not have a DCO number assigned to the originator.

3.4

Quality Assurance
is responsible for assuring that:

3.4.1

This procedure is followed.

3.4.2

The document has been assigned the correct number category.

3.4.3

The title is short and accurate.

3.4.4

All documents covered by this procedure meet documentation requirements.

3.4.5

All product specifications and manufacturing requirements are appropriate to ensure product quality.

3.4.6

New documents do not conflict with existing procedures or protocols.

3.4.7

Documents do not compromise regulatory requirements.

3.5

Technical Authority is responsible for assuring that:

3.5.1
Procedures and instructions in
documents follow sound
scientific/technical principles,
and that
calculations are correct from a
theoretical and practical
standpoint.

3.5.2
A validation impact assessment
has been performed by
appropriate personnel if
applicable to
the new or revised document.

4. REFERENCES AND APPLICABLE DOCUMENTS

4.1
Company Quality Manual for
references to applicable
regulatory requirements.

4.2
09-0001-FRM-1.0, Document
Change Request Form

4.3
09-0007-SOP-1.0, Device Master
Record

4.4
12-0011-SOP-1.0, SOP Document
Preparation

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4.5
12-0015-SOP-1.0,
Preparation

4.6
12-0016-SOP-1.0,
Preparation

4.7
12-0020-SOP-1.0,
Preparation

4.8
12-0049-SOP-1.0,
Documentation, C
Control

4.9

09-0180-SOP-1.0, EC Notification
of Change Procedure

4.10
09-0083-SOP-1.0, FDA
Notification of Change

4.11
09-0004-SOP-1.0, Discrepancy
Report Procedure

4.12
10-0025-SOP-1.0, Part
Numbering

5. MATERIALS AND EQUIPMENT

5.1
Master Document Index

5.2
Authorized Document Manuals
(ADMs)

5.3
Master Document Files (MDFs)

5.4
Document Change Order (DCO)
Log

5.5
Master Document Style Sheets
and Master Document Format
Templates
. The style sheet and template
for each document type are
contained in individual SOPs for
each document type (see section
4.0).

5.5.1
Master Document Style
Sheets,
which describe the font, margin,
type style and type size
requirements, have been
developed for each of the
following document types:
- Product Number Specifications
(PNS) - 12-0016-SOP-1.0
- Manufacturing Batch Records
(MBR) - 12-0020-SOP-1.0
- Standard Operating Procedures
(SOP) - 12-0011-SOP-1.0
- Qualification and Validation
Documents (QVD) - 12-0015-SOP-
1.0

- Drawings (DWG) - 12-0049-SOP-1.0

5.5.2

Master Document Format Templates,

which describe the document content requirements and illustrate the format, have been prepared for each of the document types listed in Section 5.5.1.

5.6

For the convenience of document originators, Master Document Format Templates are available in the

MS Word template directory.

New MS Word documents may be created from these templates by selecting the

F
ile

ew...

menu commands and then selecting either "QVD-PROT", "QVD-RPRT", "NEWSOP", "NEWPNS", "NEWMBR", "BUFMBR" from the "New" dialog box.

6.

HEALTH AND SAFETY CONSIDERATIONS

6.1

None

7.

DOCUMENTATION REQUIREMENTS

7.1

Document Change I
form - Attachment I
(two pages)

7.2

Materials Control R
form - Attachment C

7.3

Regulator Assessme
(RAR) form - Attach

7.4

Document Change Order (DCO)
form - Attachment H

7.5

Document Archiving and
Distribution (DAD) form -
Attachment I

7.6

Annual Document Review form -
Attachment K

7.7

Master Document Index (with
Document Distribution Matrixes)
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Page 4 of 28

8.

DOCUMENT CREATION,
REVIEW

AND APPROVAL PROCEDURE

Note: An overview flowchart of
the document creation, review,
approval, distribution and archive
procedure is included in this SOP
as Attachment A.

8.1

Document Creation

8.1.1

Documents will be written or
prepared by an individual who is
knowledgeable about the part
or process being documented. In
the case of SOPs, for example,
this might be the person who
performs the work or who has
direct responsibility for the
performance of the work. The
person who writes or prepares
the document is called the
originator.

8.1.2

The draft document is prepared
using the approved standard
format. Document templates
with the approved standard
format are included in individual
SOPs for each document type.

Contact Document Control for a copy of the appropriate SOP. Templates are also available on the company's computer network.

8.1.3

For documents other than Drawings, the new document can be identified on the network (or on transfer disk) using the following convention:

_____.
where the first six characters are used for the document number, the seventh and eighth characters indicate the dash number (01, 02, or 51 etc.) and the final three characters (after the

period) indicate the document type (MBR, PNS, SOP, etc.)

8.1.4

Documents should be written clearly, creating a document that is specific and informative, yet flexible and practical.

8.1.5

If applicable, data to support the document must be compiled and attached to the draft document. For example, data to support test specification acceptance criteria, production time limits, selection of authorized manufacturers, etc. should be included in the Document Change Request (DCR) packet.

8.1.6

Determine a clear, concise title for the document. Keep in mind that the title will need to contain all key words that may be useful in a computer search for the document at some future date. Document titles also need to be consistent with existing related documents.

8.1.6.1

Document Control can be contacted for assistance with naming QVDs and SOPs.

8.1.6.2

Materials Control can be contacted for assistance with naming PNSs, MBRs and DWGs.

8.1.7

In the case of new product development, the designer of the new product will work closely with the Originator to assure accurate transfer of product design information into the document.

8.1.8

Document identification number for new documents (or document revision letters for existing documents) are assigned by Document Control using the Document Identification Number Scheme (Attachment B).

Note: Part numbers are assigned by Engineering. Document Control incorporates the part number assigned by Engineering into the document identification number.

8.1.8.1

When a new document number is requested, Document Control records the document number, the originator/requester, the document title and the date on the appropriate index.

8.1.8.2

The Document Indexes are maintained by Document Control. Property of Doxpub, Inc. 09-0001-SOP-1.0

All proprietary rights reserved.

Page 5 of 28

8.1.8.3

Assigned numbers will not be reissued to another document without approval from the Director of QA/QC.

8.2

Initiation of Document Change Request

Note: If the only change to a document is that required by a DR, then the signed DR may take the place of a DCR. Therefore the document can go straight to DCO routing.

8.2.1

The Originator fills out the top portion of the Document Change Request (DCR) form including the document title, document number (including type and current revision), a description of the change, a brief statement regarding the reason for the change, and a list of documents affected by the change (if applicable). The description of the change should be quite specific so that the information can be utilized for QA annual summaries and reports.

The document(s) to be changed or the draft document(s) are attached to the DCR.

8.2.1.1

For SOPs and QVDs, approval of changes to the document results in a change in the revision letter of the document.

8.2.1.2

For MBRs, PNSs, and DWGs, approval of changes in form, fit or function result in a change in the part number and a change in the revision letter of the document.

8.2.1.3

For MBRs, PNSs and DWGs, approval of changes which do not affect form, fit or function results in a change in the revision letter of the document.

8.2.1.4

To improve routing efficiency, each document should have its own individual DCR form. The exception to this would be in the case where a change impacts multiple documents. For example, a change to a single part may impact the MBR, PNS and DWG for that part number. An addendum to the DCR form has been provided for in cases where more than six documents are being routed on the same DCR (see Attachment F).

8.2.1.5

Do not group multiple documents on a single DCR that require a different set of DCR reviewers.

8.2.1.6

The Originator is responsible for initiating changes to affected related documents.

For assistance in determining affected related documents, the Originator should contact their supervisor, Materials Control, and/or Document Control.

8.2.1.7

Additional documents may be added to the DCR packet to assist reviewers with the review process. These documents are marked "For Reference Use Only".

8.3

Materials Control Review

If the document affects a part or product (PNS, MBR or DWG), a Materials Control Review (MCR) form must be completed (Attachment G). Note: In some cases, changes to SOPs or QVDs may also require a Materials Control Review when the changes affect a part or product.

8.3.1

The Originator provides information required by Materials Control.

8.3.1.1

A description of the change to the identified part number.

8.3.1.2

What other part numbers are affected by the change.

8.3.1.3

If the estimated cost of the new part or revised part is known, order lead time and/or availability and storage location, this information should also be indicated on the MCR.

8.3.1.4

The Originator recommends whether the change needs to be implemented immediately, thereby obsoleting all existing parts in inventory. Alternately, the change may be implemented after all existing inventory has been exhausted, all inventory has been reworked, or inventory is not affected

interpret technical drawing Modification History Not Applicable Unit Descriptor Unit descriptor This unit covers interpreting technical drawing applying to any of the full range of engineering disciplines.

Application of the Unit

Application of the unit Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines. Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries. Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Unit MEM16006A (Organise and communicate information). Band: A Unit Weight: 4 Licensing/Regulatory Information Not Applicable Approved Page 2 of 8

3 Pre-Requisites Prerequisite

units Employability Skills Information Employability skills This unit contains employability skills. Elements and Performance Criteria Pre-Content Elements describe the essential outcomes of a unit of competency. Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide. Approved Page 3 of 8

4 Elements and Performance Criteria ELEMENT 1. Select correct technical drawing 2. Interpret technical drawing PERFORMANCE CRITERIA 1.1. Drawing is checked and validated against job requirements or equipment Drawing version is checked and validated Components, assemblies or objects are recognised as required Dimensions are identified as appropriate to field of employment Instructions are identified and followed as required Material requirements are identified as required Symbols are recognised in the drawing as appropriate. Required Skills and Knowledge REQUIRED SKILLS AND KNOWLEDGE This section describes the skills and knowledge required for this unit. Required skills Look for evidence that confirms skills in: checking the drawing against job requirements/related equipment in accordance with standard operating procedures confirming the drawing version as being current in accordance with standard operating procedures where appropriate, obtaining the current version of the drawing in accordance with standard operating procedures reading, interpreting information on the drawing, written job instructions, specifications, standard operating procedures, charts, lists and other applicable reference documents checking and clarifying task related information undertaking numerical operations, geometry and calculations/formulae within the scope of this unit Required knowledge Look for evidence that confirms knowledge of:

application of AS in accordance with standard operating procedures relationship between the views contained in the drawing Approved Page 4 of 8

5 REQUIRED SKILLS AND KNOWLEDGE objects represented in the drawing units of measurement used in the preparation of the drawing dimensions of the key features of the objects depicted in the drawing understanding of the instructions contained in the drawing the actions to be undertaken in response to those instructions the materials from which the object(s) are made any symbols used in the drawing as described in range statement hazard and control measures associated with interpreting technical drawings, including housekeeping safe work practices and procedures Approved Page 5 of 8

6 Evidence Guide EVIDENCE GUIDE The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package. Overview of assessment Critical aspects for assessment and evidence required to demonstrate competency in this unit Context of and specific resources for assessment Method of assessment A person who demonstrates competency in this unit must be able to interpret technical drawings as described. Assessors must be satisfied that the candidate can competently

and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace

procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. Guidance information for assessment
Approved Page 6 of 8

7 Range Statement RANGE STATEMENT The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included. Interpret technical drawing AS is an extensive work and the candidate is not required to have complete familiarity with all its contents, the application of AS1100 would usually be in line with standard operating procedures; interpretation may require guidance particularly in respect to any geometric tolerancing Unit Sector(s) Unit sector Co-requisite units Co-requisite units Approved

commission split air conditioning systems

MEM18084A Commission and decommission split air conditioning systems Release: 1 MEM18084A Commission and decommission split air conditioning systems Modification History Not Applicable Unit Descriptor

Assembly Drawings are those drawings which shows an entirety of a machine or system with all its components located and identified. The purpose of an assembly drawings is item identification, labeling the sequence for assembly and sometimes to even mention standard requirements. These drawings also show orthogonal plans, sections, elevations, weight, mass, Bill of Materials(BOM) etc. These drawings act as universal graphic language between two technical people so that they can convey their ideas.

Assembly drawings are made for machineries, devices, units and products. They can also be a part of [Mechanical Drafting Services](#) helping to assemble a complex part of a mechanism or simply to amass a kit like in the case of furniture. An assembly drawing should meet the below three requirements:

1. Maintenance requirement
2. Operational requirement
3. Manufacturing requirements

Importance of Assembly Drawings:

Assembly Drawings prepared by any technical person must be clear with no scope for misinterpretation. To produce machine and automobiles on a mass scale which constitute of many assemblies and sub-assemblies wouldn't be possible if not for clear, correct and accurate drawings. To draft these drawings, the person must have a

thorough technical knowledge of the both the principles and conventional practice of drafting. If not this could be open to misinterpretation and possibly litigation. Moreover, the person interpreting these drawings must also be proficient in understanding the graphical language used in the assembly drawings, or else it would be challenging to produce the machine in the intended manner.

In the absence of Assembly Drawings, the ideas on technical matters have to be conveyed by speech or writing, instead of graphical language. This makes it difficult for the shop floor level to understand, as well as is error prone and time and labour consuming. It is the effective use of Assembly Drawings that objects such as aircrafts, automobiles, locomotives, etc., have been produced.

Based on the use Assembly Drawings are generally classified into below five categories:

Types of Assembly Drawings:

The main purpose of General Assembly Drawings is to identify the various components and show their working relationship. It contains a detailed drawing of the said component, the sub assembly and how to make the final assembly. They can be further divided into four categories:

1. General Assembly Drawings:

a. Design Drawings: These are drawings which are made on the design stage. These drawings show the machine which is to be assembled from all angles. These drawings or layout aid in visualizing the performance of the machine. Here the shape and clearances of various parts comprising the machine can be clearly seen.

b. Detailed Drawings: A detailed assembly drawing shows how all the components of a machine are assembled and also provides specifics like the materials used, the dimensions, joining techniques etc. These drawings are ideally used for assembling smaller machines which comprise of smaller parts. In addition to the regular assembly drawings, enlarged views of specific parts and how they will fit together can also be drawn up.

In assemblies such as automobile, lathe etc. comprise of pre-assembled components as well as individual parts. These distinct groups of components can be assembled, and often tested, as a unit before they are put into their final arrangement. These pre-assembled units are known as sub-assemblies. A sub-assembly drawing refers to an assembly drawing of a group of related parts, that form a part in a more complicated machine.

c. Assembly Drawings for catalogues: These are special assembly drawings which have been prepared for company catalogues. These drawings show only the relevant details and

dimensions that would interest a potential buyer.

d. Assembly Drawings for instruction manuals: Assembly Drawings for instruction manuals are used when a machine which is in assembled condition has to be knocked down to check for all the parts. It is then shipped away to be reassembled and installed elsewhere. In these drawings each component is numbered, which is useful in the reassembly process.

2. Installation Drawings:

These are the drawings which are constructed for the erection or the assembly of a product. It provides information regarding how a component will be positioned in relation to its supporting or adjacent components. It also provides information about dimensional data, hardware description and general configuration. These drawings provide useful information for assembling the machine, as they reveal all the parts of a machine in their correct working position.

3. Exploded Assembly Drawing

These are technical drawings of an object that shows its various components. The 3D exploded diagrams generated through [Assembly Modeling Services](#) shows the components slightly separated or suspended in surrounding space in sequence of assembly. This gives an idea about how the final product will fit together. These drawings are simple to understand for even a

layman, and hence are used in parts catalogs, assembly, manuals or instruction materials.

4. Schematic Assembly Drawing

A schematic is defined as picture that shows something in a simple manner by using symbols. A schematic drawing represents the components of a process or a device using standardized symbols and lines. This simplified illustration of the machine or of a system, replaces all the elements, by their respective conventional representations. These drawings are useful as its very difficult to understand the operating principles of complicated machinery, merely from the assembly drawings. Schematic representation of the unit facilitates easy understanding of its operating principle.

5. Machine Shop Drawing

The machine shop drawings are for the end user i.e. the person operating the machine. Since the machinist is not concerned with the dimensions and information related to the previous stages only the information pertaining to functioning of the machine is provided. Based on the same principle, one may shop drawing, part drawing, sheet metal etc.

Conclusion:

It takes skill and effort in order to create machine shop drawings. The engineer should be aware of the principles

operation and the application of the machine. Any error in creation of these drawings could negatively impact the functioning of the machine.

Version Control

Date

Author

Version/Page

Reason for change

Estates

Assurance

Manager

/Assurance Lead

v

1.1

=

3

Under review

Jun

e

2022

Estates Assurance

Manager

/Assurance Lead

V2.0

Approved by Policy Approval Group

Executive Summary

y

NHS Lothian acknowledges the requirement to have measures in place to effectively manage electrical high voltage systems as part of its responsibility as an employer for providing a safe working environment for its employees and others affected by its work

-

This policy will help NHS Lothian to reinforce its commitment to the health, safety, and welfare of its employees and stakeholders and ensure measures are in place to

2

comply with current legislation

and guidance including:

=
Health and Safety at Work Act
1974

=
Electricity at Work Regulations
1989

5.0

Implementation roles and r
esponsibilities

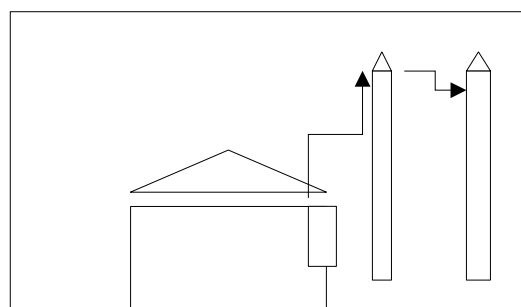
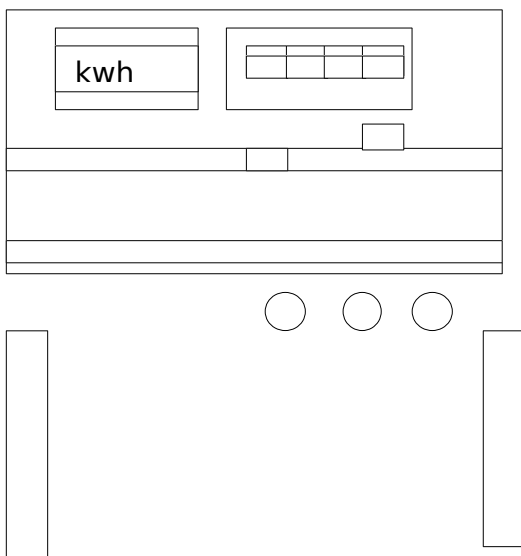
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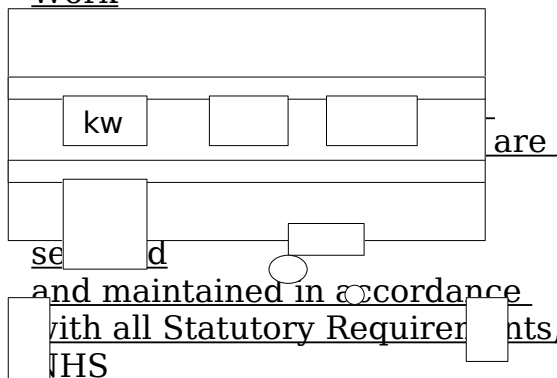
Associated
materials

Panel electrical , interpreter

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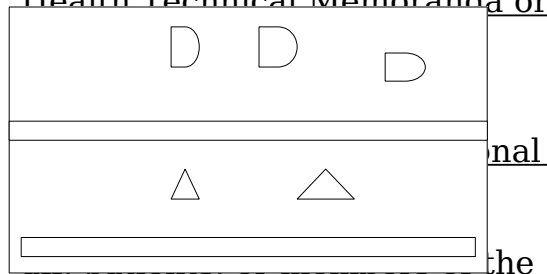


roles and
carry out their duties in
compliance with the Electricity at
Work



se
and maintained in accordance
with all Statutory Requirements,
NHS

Guidelines, Scottish
Health Technical Memoranda or

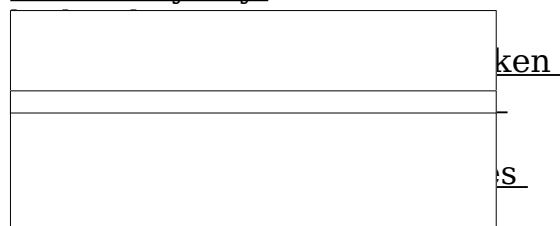


public.

3.0

scope

this applies persons
(staff, contractors, visitors) who may be
affected by any



leased

by the Board, and at any

properties that may

or leased in the future

4.0

Definitions

AE

=

Authorising Engineer

AP

=

Authorised Person/s

CP

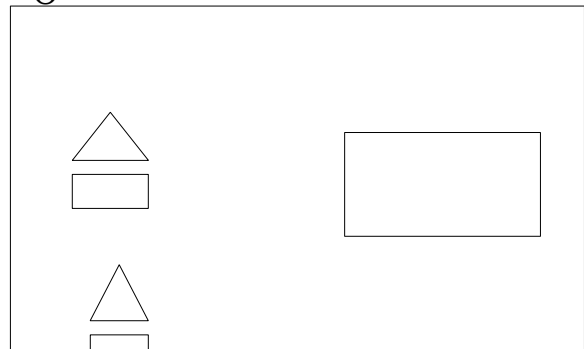
=
Competent Person/s
DH

=

Duty Holder

DN

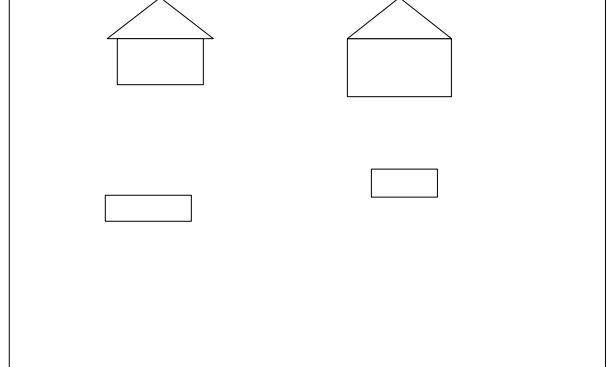
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=

Standard Operational Procedures
High Voltage Electrical Systems
Policy (Estates & Facilities),
Review date: June

Audit



Circuit Earth

=

a point within any given circuit
where the potential of all other
voltages in the
circuit are referenced.

contra

ors

parties who undertake work
on, or on behalf of NHS Lothian.
This includes
persons brought in for a
specific task or time period but
not those who have an on

going supply agreement with the Board.

Electrical equipment

= anything used, intended to be used or installed for use in order to generate, provide, transmit, transform, rectify, convert, conduct, distribute, control, store, measure

^ or use electrical energy.

Employees

= all direct NHS Lothian employees and agency staff

Voltage Range

= This is defined in Scottish Health Technical Memorandum (SHTM 06

-extra

= Low voltage: a potential not exceeding 50V ac or 120V ripple

= free dc

^ whether between conductors or to earth.

2. Low voltage (

L V
): a potential not exceeding 1,000V ac or 1,500V dc

^ between conductors, or 600V ac or 900V dc between a conductor and earth.

3. H

igh voltage (HV): a potential normally exceeding low voltage.

Mechanical Isolation

= a means of isolating non electrical supplies (gas, air, water etc) to allow maintenance on the non

= electrical parts of equipment, plant and machinery.

Method Statement

= A document outlining the exact process to be followed for a particular task to be completed safely

^ The statement need be no longer than necessary to achieve these objectives effectively.

Permit to Work

= a documented procedure that authorises certain people to carry out specific work within a specified time frame. It sets out the precautions required to complete the work safely, based on a risk assessment. It describes what work will be done and how it will be done; the latter can be detailed in a 'method statement'.

Personal Protective Equipment (PPE)

= equipment that will protect the user against health

or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high visibility clothing, safety footwear and safety harnesses

Scottish Health Technical Memorandum (SHTM)

a series of documents which detail best practice guidance for healthcare engineering

Stored Energy

energy present within items of electrical apparatus

such as batteries and capacitors

which pose a threat even after the isolation of equipment. High Voltage Electrical Systems Policy (Estates & Facilities), Review date: June

Station

means any premises, or that part of the premises, in which electrical energy is transformed or converted to or from pressure above low pressure except for the purposes of working instruments, relays, or similar auxiliary apparatus, if such premises or part of premises are large enough for a person to enter after the apparatus is in position. Switchgear

= any apparatus within the electric power system, or grid, refers to the combination of electrical disconnects, fuses and/or circuit breakers used to isolate electrical equipment.

Technical Knowledge

= Specific knowledge needed to carry out work on electrical High voltage systems. This can be demonstrated in the form of a combination of qualifications and practical experience.

5.0

Implementation roles and responsibilities

5.1

Management

The Chief Executive and his nominated staff as duty holders are responsible for the safety of High voltage (HV) electrical systems on their premises. The Electricity at Work Regulations 1989 imposes duties on employers to comply with these insofar as they relate to matters which are within their control. These duties are in addition to the ones imposed by the Health & Safety at Work Act 1974. Management must formally nominate in writing a 'Designated Person' with responsibility for the HV Electrical Safety Policy.

5.2

Designated Person

An individual who has overall authority and responsibility for the High

voltage electricity
system within the premises and
who has a duty under the HSW
Act 1974 to prepare and
issue a general policy statement
on health & safety at work,
including the organisation and
arrangements for carrying out
that policy. This p
erson should not be the
authorising
engineer

=
NHS Lothian's Head of Estates is
normally appointed as the
designated person.
It is the responsibility of the
designated person to:

=
Appoint in writing an Authorising
Engineer (
HV
) for all systems and install
ations for
which management has
responsibility.

=
Review the AE (
HV
)'s appointment annually to
ensure their duties have been
carried out
in accordance with all relevant
guidance and legislation
including SHTM
Designated Person to appoint
Authorised

P
ersons
(HV)
on recommendation of
Authorised
Engineer

=
Agree any loc
al variations from this guidance.
High Voltage Electrical Systems
Policy (Estates & Facilities),
Review date: June

Authorising Engineer

(
HV
)
A chartered engineer with
appropriate experience or an
incorporated electrical engineer,
who possesses the necessary
degree of independence from
local
management and
is
appointed in writing by
the 'Designated Person' to
implement, administer and
monitor the
application of SHTM
06

=
03

=
The Authorising Engineer (
HV
)'s responsibilities include the fol
low
ing:

=
A
ssess and recommend in writing
sufficient 'Authorised Persons' (
HV
) to provide the
necess
ary cover for all systems and
installations for which
management has
responsibility.

=
Define the exact extent of the
systems and installations for
which each Authorised
Person (
HV
) is responsible and, where
appropriate, any part of the
system which is
exclu
ded from the Authorised Person (
HV

)'s responsibilities.
=
Maintain a register of all
Authorised Persons (
HV
).
=
If necessary
=
recommend the suspension or
cancellation of the appointment
of an
Authorised Person (
HV
) and withdraw the
certificate.
=
Ensure that
candidates for appointment as
Authorised Persons (
HV
):
o
satisfy the qualification, training
and familiarisation
requirements.
o
can demonstrate competence,
ability, and adequate knowledge
of each system,
installation and type of
equipment for which
authorisation is sought
5.4
Authorised Person (
HV
)
An individual possessing
adequate technical
knowledge and
having received appropriate
training. An Authorised Person (
HV
) is appointed in writing by the
Designated Person on the
recommendation of the
Authorising Engineer (
HV

) and is responsible for the
imp
lementation and operation of
SHTM
06
=
03
with regard to working on, or the
testing of
electrical
High
voltage systems
.
Although there may be more than
one appointed AP(HV) within an
area, there must only be
one on duty at any given time and
handover betwee
n APs should be recorded in the
operational logbook.
The Authorised Person (
HV
)'s responsibilities include the
following
:
Control the work on
High
voltage systems, prepare
inspection, maintenance and
safety
programmes and progress the
work.
=
Ensure that a
ny alterations or installation of
equipment do not compromise
the
electrical system;
=
Ensure that all records
concerning
High
voltage systems are kept
up
to date.
=
Ensure that any person working
on the system is competent to do
so.

Ensure that test equipment is maintained in good condition.

High Voltage Electrical Systems Policy (Estates & Facilities),

Review date: June 20

Cooperate with the Authorising Engineer (HV) in matters of policy concerning High voltage systems.

Report in writing any dangerous and/or unusual occurrences to the Designated Person and Authorising Engineer (HV).

Make routine inspections of HV substations

switchrooms

and electrical enclosures at least once every 3 months

Ensure that the necessary warning signs are displayed in substations at all times;

Deciding the following prior to the issue of a safety document:

whether live working is essential.

whether circuit earths are required, and if so, the number and points of

application.

whether any action is required to contain or dissipate stored energy.

whether any additional precautions are necessary, for example mechanical isolation.

whether personal supervision is required.

safety has been achieved and will be maintained where the requirements of the safety document are completely implemented.

the contents of the safety document to be issued are correct and unambiguous.

When issuing a safety document:

ensure that the contents of the safety document are fully explained to the recipient, and that the recipient understands the nature and extent of the work or testing to be done and the safety precautions to be taken.

provide any keys as appropriate and note any circuit earths considered necessary.

When cancelling a safety document:

ensure that the declaration (clearance section) has been signed and the requirements satisfied.

Competent Person / Contractor's Copy to be destroyed in presence of authorising officer.

5.5

Competent Person (HV

)

Individuals recognised by the Authorised Person as having sufficient technical knowledge and experience to work on the HV system and prevent danger and risk of injury. They will not normally be employed by NHS Lothian

The Competent Person (HV)'s responsibilities can be summarised as:

=

Competent persons (HV) shall use safe methods of work, safe means of access and the personal protective equipment and clothing provided for their safety.

Competent persons (HV) when in receipt of safety document, shall:

o

be fully conversant with the nature and the extent of the work to be done.

o

read the contents and confirm to the person issuing the safety document that they fully understand.

High Voltage Electrical Systems Policy (Estates & Facilities), Review date: June during the course of the work, adhere to, and instruct others under their charge to adhere to, any conditions, instructions or limits specified on the safety document

+

o

retain the safety document and (where appropriate) keys in safe custody, and correctly implement any management procedure to achieve this.

o

when in charge of work, provide immediate or personal supervision as required.

o

warn all persons as quickly as possible to withdraw from, and not to work on, the equipment concerned until further notice if a hazard arises, or is suspected, during the course of work which could result in danger. The situation shall be reported immediately by the competent person to an authorised person.

o

Competent persons (HV) clearing a safety document shall do so only after all persons working under the safety document have been withdrawn from, and warned not to work on, the equipment concerned. Where appropriate, they shall ensure that all

tools, gear and loose material have been removed, guards and access doors replaced, and the workplace left tidy in a safe condition.

5.6

Accompanying Safety Person (HV

)

An individual not involved

in t

he task who has received training in emergency first

-

aid for

electric shock and who has adequate knowledge, experience and the ability to avoid danger, keep watch, prevent interruption, apply first aid and summon help.

The person will be

familiar with the installation or existing

HV

system being worked / tested on and will have

been instructed on the action to be taken to rescue a person safely in the event of an accident.

The Accompanying Safety Person (HV

)

shall be trained to recognize imminent danger, c

ut off

supplies, and shall hold a valid First Aid training certificate.

The Accompanying Safety Person (HV

)

shall be present whenever the Authorised Person

(HV

)

deems it necessary, and in the fol

low

ing circumstances:

=

While equipment is being proved or co

nfirm ed

dead.

=

While equipment is being earthed, other than by means of a

switch or

circuit breaker

±

=

Where equipment cannot be confirmed dead until the

Competent Person (

HV

) has made

conductors accessible.

=

While the Authorised Person (HV) is

spiking a cable.

=

While testing is being undertaken at high voltage.

=

While a high voltage potential indicator is in use

While voltage and phasing tests are being undertaken at high voltage

While any person is opening or working in a high voltage enclosure.

5.7

Legal Requirements

5.7.1

Delegation of Responsibility to Comply with The Regulations High Voltage Electrical Systems Policy (Estates & Facilities),

Review date: June

It shall be the duty of the

Authorised Persons

(HV)

to comply with these regula tions. It shall

also be the duty of all Competent Persons, Crafts persons, and persons employed to conduct their work in accordance with the regulations. Further guidance is contained in Scottish Health Technical Memorandum

-
06

-
03 Electrical safety guidance for high voltage systems.

5.7.2
Person in Charge of

a
SubStation

All substations should be kept locked, the locks being identical so that a single key will enable access to be gained to any substation over which Management has control or a degree of control on a site.

5.7.3

The Authorised Person

The Authorised Person means (a) the Estates Officer, or (b) a Contractor for the time being

under contract with the Estates Officer, or (c) a person employed, appointed, or as aforesaid, to carry out certain duties incidental to the generation, transfor

mation, distribution, or the use of electrical energy,

such Estates Officer, Contractor, or person being

a person who is competent for the purpose of the regulations in which the term is used.

6.0 Associated Materials NHS Lothian Standard Operating Procedure for

the Management of Electrical High Voltage Systems (to be drafted)

.The responsibility for the approval of the above procedure sits with the NHS Lothian Facilities Policy Group.

7.0

E
vidence base

-
<https://www.hse.gov.uk/>

-
HSG253: The safe isolation of plant and equipment

-
Health and Safety at Work Act 1974

-
Electricity at Work Regulations 1989

-
BS7671:2018 | IET Wiring Regulations | 18th Edition

-
Provision and Use of Work Equipment Regulations 1992

-
Scottish Health Technical Stakeholder consultation

This
policy

has been discussed and reviewed by Estates Management, Partnership and

relevant Authorising Engineer.

The draft policy was placed on the NHS Lothian Consultation Zone to give all NHS Lothian staff an opportunity to provide feedback/comment.

High Voltage Electrical Systems Policy (Estates & Facilities),

Review date: June

Monitoring and review

To ensure the maintenance and operational arrangements remain effective, the condition and performance of all electrical systems should be continually monitored.

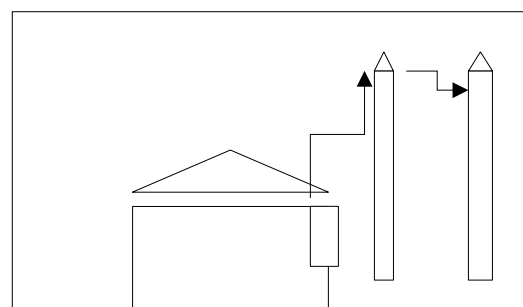
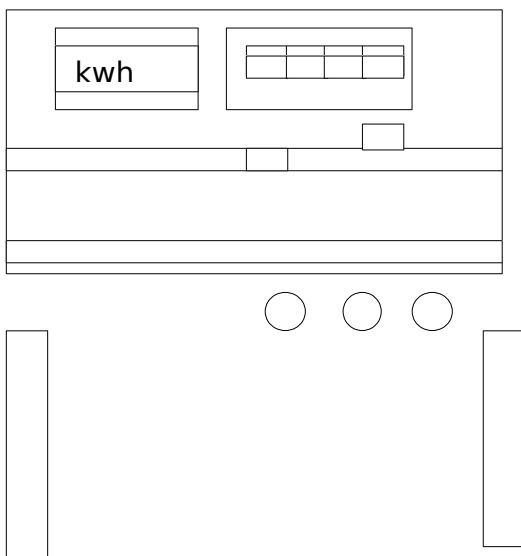
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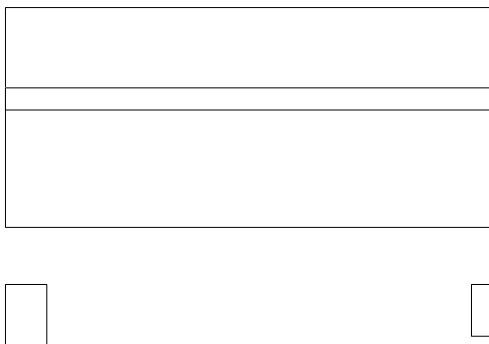
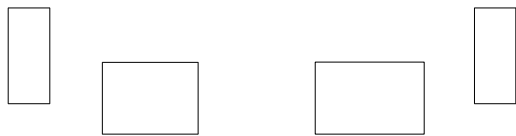
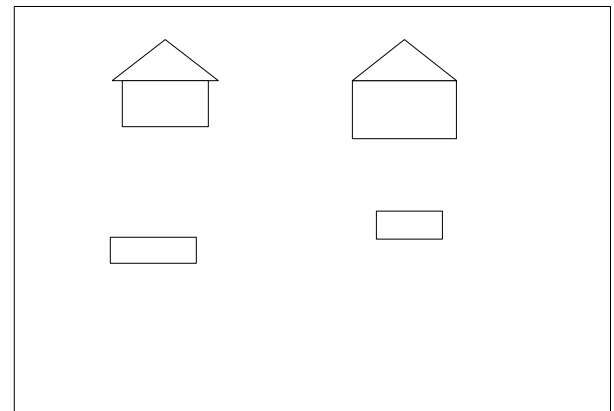
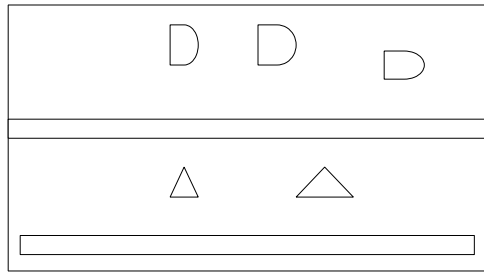
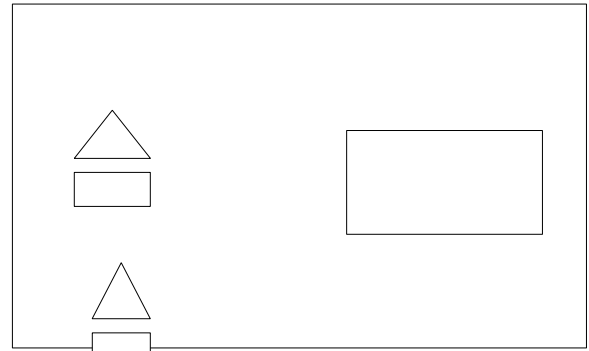
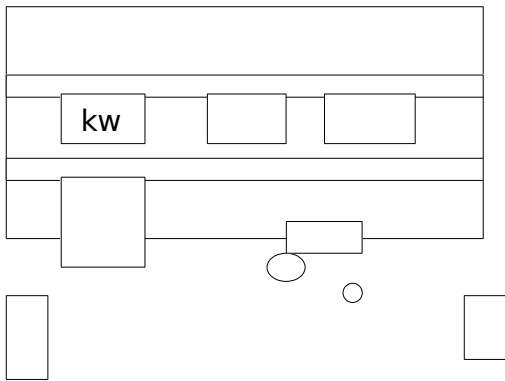
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All local procedures and performance data should be updated as a result of annual monitoring and auditing by the appointed Authorising Engineer (HVA)

Panel electrical , interpreter

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-soldering technique the basic de soldering,

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Understanding Electrical Wire Labeling

What do the Labels Mean?

Labels on Non-Metallic Cable (Romex)

The most common type of wiring used in homes is non-metallic (NM) cable, commonly called "Romex," after the popular brand name. New NM cable contains two or more insulated conducting wires and usually a bare ground wire. The wires may be wrapped in paper, and all of the wires are encased in a flexible plastic jacket or sheathing.

The labels on the outer sheathing of NM cable indicate the size, or gauge, of the individual conducting wires, the wire material, the number of wires contained inside the cable, the maximum voltage rating, and whether there is a ground wire present. The wire size and

number of wires are indicated with numbers. A ground wire is indicated by "G," "w/G," or "with Ground." The wire material is indicated by "CU" for copper and "AL" for aluminum.

Here are some examples of labels on common cable types used in home wiring:

- **14-2G:** Cable contains two insulated wires plus a ground wire; the wires are 14-gauge.
- **14-3G:** Cable contains three insulated wires plus a ground wire; the wires are 14-gauge.
- **12-2 w/G:** Cable contains two insulated wires plus a ground wire; the wires are 12-gauge.
- **12-3 w/G:** Cable contains three insulated wires plus a ground wire; the wires are 12-gauge.
- **600 V:** Cable is rated for a maximum of 600 volts; this

is standard for residential NM cable.

- **TYPE NM-B:** Non-metallic type-B cable; this is the current standard for residential installations. "NM-B" cable is more heat-resistant than older "NM" cable.

Underground Feeder Cable

Most NM cable is used in "dry," or interior, locations, where the cable is protected inside wall, ceiling, and floor cavities.

Underground feeder (UF) cable is a special type of non-metallic cable that is suitable for "wet" locations, or for unprotected locations like direct burial in the ground. UF cable is usually gray (not white, yellow, orange, or black, like standard NM cable); it is labeled "UF-B" and may include "Sunlight Resistant" or similar wording. UF cable uses the same symbols as standard NM cable to indicate the number and gauge of wires.

Labels on Individual Wires

Individual insulated wires are used in home wiring when an installation calls for conduit—
a rigid or flexible protective pipe or tubing through which the wires are run. Electricians buy the individual conducting wire by the spool so they can pull different wires from different spools as needed.

The important labeling on individual wires relates to the wire insulation—the plastic coating that covers the metal conducting wire. The most

common types of wire used in home wiring include:

- THHN
- THWN
- THW
- XHHN

Here's what the letters on the labels mean:

- **T:** Thermoplastic insulation, a fire-resistant material
- **H:** Heat-resistant; able to withstand temperatures up to 167 F.
- **HH:** Highly heat-resistant; able to withstand temperatures up to 194 F.
- **W:** "Wet," or approved for [damp and wet locations](#); this wire is also suitable for dry locations
- **X:** Insulation made of a synthetic polymer that is flame-retardant
- **N:** Nylon-coated for resistance to oil and gasoline

Labels on Low-Voltage and Thermostat Wires

Low-voltage wiring used around the home includes small non-metallic cable used for thermostats and other control devices and paired insulated wire used for landscape lighting systems. Three other types of low-voltage wires typically show up in homes, too: phone wire, network wiring, and TV cable.

Wire for landscape lights usually is black and has labeling stamped into the wire insulation. Labels typically include:

- **Wire size:** Indicated by a number (such as 12, for 12-gauge) or a number followed by "AWG," for American Wire Gauge.
- **Number of wires:** Usually indicated by the number 2; landscape wiring typically has two insulated wires stuck together (similar to a lamp cord) and contains no ground wire.
- **Properties:** Wording indicating sunlight-resistance or suitability for underground installation.

[Thermostat](#) cable is similar to NM cable but contains four or more small insulated wires and no ground wire. The cable may or may not be labeled. Each wire has its own color to help you connect to the appropriate terminal at the thermostat and the equipment it controls. Although color coding is not universal, the lettering on the thermostat terminals is relatively standard:

- **C:** Common wire; allows for continuous power flow from the R wire; not all thermostats use this terminal
- **R:** 24-volt power supply from the furnace transformer
- **Rc:** Calls for heat or cooling; there may be more than one Rc terminal
- **G:** Fan
- **W:** Heat
- **Y:** Air conditioner

Rules for Outdoor Receptacles

Many of the rules applying to outdoor receptacle outlets are aimed at reducing the likelihood of shock, which is a notable risk anytime a user is in direct contact with the earth. The principal rules for outdoor receptacles include:

- [GFCI \(ground-fault circuit-interrupter\)](#) protection is required for all outdoor receptacles. Specific exceptions may be made for snow-melting or deicing equipment, where the equipment is powered by an inaccessible outlet. The required GFCI protection can be provided by GFCI receptacles or GFCI circuit breakers.
- Homes must have at least one outdoor receptacle at the front and rear of the house. They must be readily accessible from the ground and positioned no more than 6 1/2 feet above grade (ground level).
- Attached decks and balconies with interior access (including a door to the indoors) must have a receptacle no more than 6 1/2 feet above the deck or balcony walking surface. As a general recommendation, houses also should have a receptacle at each side of a deck or balcony, accessible from the ground.
- Receptacles in damp locations (under protective covers, such as a porch roof) must be weather-resistant and have a weatherproof (weathertight) cover.

- Receptacles in wet locations (exposed to weather) must be weather-resistant and have a [weatherproof "in-use" cover](#). This cover provides sealed weather protection even when cords are plugged into the receptacle.
- A permanent swimming pool must have access to an electrical receptacle that is no closer than 6 feet and no further than 20 feet from the closest edge of the pool. The receptacle must be no higher than 6 1/2 feet above the pool deck. This receptacle must have GFCI protection.
- Receptacles used to power pump systems on pools and spas must be no closer than 10 feet from the inside walls of a permanent pool, spa, or hot tub if they are not-GFCI protected, and no closer than 6 feet from the inside walls of a permanent pool or spa if they are GFCI protected. These receptacles must be single receptacles that serve no other devices or appliances.

Rules for Outdoor Lighting

The rules for outdoor lighting are principally about using fixtures that are rated for use in damp or wet locations:

- Light fixtures in wet/exposed areas must be listed for use in wet locations.
- Light fixtures in damp areas (protected by an

overhanging eave or roof) must be listed for damp locations.

- [Surface-mounted](#) electrical boxes for all electrical fixtures must be raintight/weatherproof.
- Exterior light fixtures do not require GFCI protection.
- [Low-voltage lighting systems](#) must be listed by an approved testing agency as an entire system or assembled from individual components that are listed.
- Low-voltage light fixtures (luminaires) must be no closer than 5 feet away from the outside walls of pools, spas, or hot tubs.
- Transformers for low-voltage lighting must be in accessible locations.
- Switches controlling pool or spa lights or pumps must be located at least 5 feet from the outside walls of the pool or spa unless they are separated from the pool or spa by a wall.

Rules for Outdoor Cables and Conduits

Even though standard NM cable has a vinyl outer jacket and waterproof insulation around the individual conducting wires, it is not intended for use in outdoor locations. Instead, cables must be approved for outdoor use. And when using conduit, there are additional rules that must be followed. The applicable rules for outdoor cables and conduits include:

- Exposed or buried wiring/cable must be listed for its application. Type [UF cable](#) is the most commonly used nonmetallic cable for residential outdoor wiring runs.
- UF cable can be direct-buried (without conduit) with a minimum of 24 inches of earth cover.
- Wiring buried inside rigid metal (RMC) or intermediate metal (IMC) conduit must have at least 6 inches of earth cover; wiring in PVC conduit must have at least 18 inches of cover.
- Backfill surrounding conduit or cables must be smooth granular material without rocks.
- Low-voltage wiring (carrying no more than 30 volts) must be buried at least 6 inches deep.
- Buried wiring runs that transition from underground to above ground must be protected in conduit from the required cover depth or 18 inches (whichever is less) to its termination point above ground, or at least 8 feet above grade.
- Electrical service wires overhanging a pool, spa, or hot tub must be at least 22 1/2 feet above the surface of the water or surface of the diving platform.
- Data transmission wires (telephone, internet, etc.) must be at least 10 feet above the surface of the water in pools, spas, and hot tubs.

Call Before You Dig

This is not an NEC requirement, but it could save your life, not to mention prevent considerable trouble with your service providers. [Call 811](#), the national "Call Before You Dig" hotline, at least three days before you plan to dig anywhere on your property. The hotline personnel will notify all utility providers in your area. Those with lines running through your property will send out a representative to mark their line(s) on the ground. You can use power equipment to dig no closer than 24 inches to marked lines, but you must use a hand shovel when digging within 24 inches of either side of a marked li

1. [ANSI Electrical Labeling Standards](#)
2. [What Are the Standards](#)
 1. [Coloring Options](#)
3. [Labeling Very Small Conduits](#)
4. [What Belongs on Electrical Conduit Labels](#)
 1. [Choosing Quality Conduit Labels](#)
5. [Heat Shrink Labeling](#)
6. [Self-Print Sticky Labels](#)
7. [Conduit Tags](#)
 1. [Maintaining Electrical Conduit Labels](#)
8. □ Outside Conduit Diameter of .75-1.25" requires a label length of 8" and letter height of .5"
9. □ Outside Conduit Diameter of 1.5-2" requires a label length of 8" and letter height of .75"
10. □ Outside Conduit Diameter of 2.5-6" requires

a label length of 12" and letter height of 1.25"

11. □ Outside Conduit Diameter of 8-10" requires a label length of 24" and letter height of 2.5"

□ **Outside Conduit Diameter of Greater than 10" requires a label length of 32" and letter height of 3.5" Labeling Very Small Conduits**

For very small electrical conduits, the standard practice is to use labeling that is as large as will fit. Some very small conduits can have tags applied rather than labels. These tags are tied or wrapped around the conduit. While not ideal for most situations, this is something to be aware of. This can also apply when running single wires through an area rather than through a normal conduit. The important thing to remember here is that having labels in place will help no matter the situation.

What Belongs on Electrical Conduit Labels

The most important part of any label is the text printed on it. Whether buying electrical conduit labels or printing them in-house, it is essential to ensure all the needed information is contained on the label so that when the conduits are accessed or worked on, the technicians know exactly what they are doing.

Since there is a limited amount of space on a label, not everything that might be useful will fit. With

this in mind, companies must choose what to include and what to leave off. The following are some important types of information that should be included when possible:

- **Voltage** - Labeling the level of voltage running through a conduit is critical for [safety](#). The voltage levels will determine what type of safety equipment is required when accessing it.
- **Identification Information** - Every conduit should have some type of identification number on it to differentiate it from the others. Whether this is a number, name, or other designation, having it on the label is very important.
- **Source Connection Locations** - The label should indicate where the conduit is coming from. Does the electricity come from the main power source, a generator, or a specific junction box? Listing what the next "step" back on the line connects to will assist in finding trouble if there is any.
- **Usage** - Listing where the conduit goes can be very helpful. For example, one conduit label may indicate that it provides power to one particular machine. This can reduce the need to trace back the conduit, which can help speed up troubleshooting of issues.

- **Other** - Any other information that may be helpful for a given facility.

If necessary, it can be a good idea to apply multiple labels to a single conduit. Placing them right next to each other will allow additional information to be provided. Putting the most important information on the label that is placed closest to the end of the conduit (or nearest to an access panel) is the best practice.

Choosing Quality Conduit Labels

The official standards do not specify anything about the quality of the labels used, so it is up to each facility to decide on its own. Low-quality labeling solutions can fade or fall off over time, which makes them essentially useless. Long-lasting label solutions are very important because the labels typically won't need to be read for years since electrical wiring often doesn't have problems that frequently.

Heat Shrink Labeling

One great option is to choose [heat shrink](#) labeling. These labels can be printed off either by a third party printer or using a good quality industrial label printer. Once printed, they are applied to the conduit and shrunk down using a heat gun. Once done, the label appears to become one with the conduit itself. The labeling is very durable and long lasting, which makes it a great option.

Self-Print Sticky Labels

More commonly, companies use their industrial label printer to create custom labels that will stick to the conduit. This is a very economical way to get exactly what you need, when you need it. Most electrical conduits will need to be labeled with detailed information that is specific to one company, which means generic labels won't often meet the requirements.

Having the ability to print off custom labels on site is a good option. In addition to being able to get the exact text needed, a facility that uses this option will be able to immediately print off new labels when they are required. If a new conduit is being installed, there will be no delay in getting the labeling done. If a conduit label is damaged, a new one can be printed to replace it right away.

Conduit Tags

As mentioned above, some facilities will use tags on smaller electrical conduits. This is a good solution to have available, but it should not be the first choice. Tags that dangle off the conduit can get pulled off much more easily than a label. In addition, if there are multiple conduits in an area, the tags can get tangled, and it can be confusing to see which tag applies to which conduit.

Maintaining Electrical Conduit Labels Overhead Power Lines

Transmission line voltages range between 44,000 to over 765,000 volts. When possible, stay at least 10 feet away from wires and away from power line structures where possible. Don't store anything near or underneath power lines; set up warning signs and safety barriers around potential danger zones. Until proven otherwise, assume that all downed power lines are live, and let a local utility company take care of any issue relating to them.

2. Damaged Gear

Everyone should know how to identify damaged tools and how to report them. Workers should have time to inspect their gear before every shift. Anything with cracks, cuts, rips, or tears should be replaced. Use double-insulated tools and cut connectors off damaged portable power tools until they can be repaired or replaced. When doing maintenance or repairing large machines or equipment, use a lockout/tagout system.

3. Faulty Wiring

Label electrical equipment, outlets, and cords by amperage and voltage levels. Store power tools with the proper cord to avoid hazardous mix-ups. Inadequate wiring, tangled cords, frayed or exposed wires, and other damage may mean that something isn't connected properly, so notify a supervisor if this happens.

4. Overloaded Circuits

In addition to other electrical hazards, an overloaded circuit can catch fire if it overheats. Use circuit breakers when powering more than one device per outlet to protect the circuit. Don't use surge protectors or power strips on your site—three-way extensions with GFCI provide the best protection.

5. Exposed Electrical Parts

Hanging wires, loose connections, or dangling outlets are warnings that should be reported to a manager as soon as possible. Stay alert for faulty parts and equipment. The outer insulation of wires should be intact to prevent exposure. Any openings should be shut and temporary lighting guarded.

Electrical problems can be difficult to spot but are one of the most dangerous hazards on a construction site.

6. Improper Grounding

Avoid unwanted transmission by grounding, which should come with wires and electrical equipment just in case a connection is bad. Your site should have a ground pin to return electricity to the ground, and no one should touch the

ground pin to avoid electrocution, shock, and rendering the system unsafe.

7. Damaged or Inadequate Insulation

Never use poorly insulated wires. Tape does not count as a repair, so replace any damaged wires. Keep your wires away from any hazards that could damage the insulation to keep them in good shape. Don't hang wires on sharp objects, tuck them into windows, or leave them in high-traffic areas.

8. Water

Keep moisture and water away from electrical parts and equipment. Don't go near equipment or power lines that may have been exposed to moisture. This is especially true if the insulation is damaged. When working in wet or hazy conditions, protect circuits with GFCIs, keep tools and equipment away from damp areas, and set up a shelter to reduce moisture.

9. Lack of Training

Workers should ask for assistance if they're not trained or confident in performing a task rather than try to fix something themselves. New team members should shadow senior members to increase comfort and competence. Allow extra time to inspect the surroundings and equipment before working.

Electrical problems can be difficult to spot but are one of the most dangerous hazards on a

construction site. Basic knowledge of electrical safety is a must before starting a shift, as is proper inspections of the site and equipment. If everyone knows what to look for, everyone can be safer from electrical hazards at work.

Once the [labeling](#) of electrical conduits is completed, a plan needs to be put in place for maintaining them. If a label becomes damaged or gets too dirty to read, then it won't serve its purpose. For conduits that are easily accessible, their cleaning and maintenance can be handled as part of the normal routine for the cleaning staff.

Most electrical conduits, however, run either behind a wall, under the floor, or high up in the rafters. When this is the case, they can easily be forgotten. Depending on where the labels are located, they will need to have a scheduled cleaning and inspection at least once per year.

It will take time and effort for a facility to adopt any safety effort. Labeling electrical conduits is a simple task that can be done quickly and affordably, and the facility will enjoy the benefits for years to come.

S

[**Electrical Hazards & Electrical Safety | SafetyCulture**](#)

[safetyculture.com > Topics](https://safetyculture.com/topics)

1. Overhead Power Lines · 2. Damaged Tools and Equipment · 3. Inadequate Wiring and Overloaded Circuits · 4. Exposed Electrical Parts · 5. Improper Grounding · 6.

[Electrical Safety Tips For The Workplace | SafetyCulture](#)

[safetyculture.com > Topics > Electrical Hazards & Electrical Safety](#)

11. Prevent electrical equipment from contacting wet areas · 2. Ensure safe use when unplugging · 3. Install properly and tidy electrical cords · 4.

Electrical maintenance is an essential process to any workplace. Here is a basic guide to keep your employees safe and your equipment ...

Your enquiry has been received.qcouncil

*Thank You!
Ngiyabonga!*

*Enkosi
Dankie!
Re a leboga!
Ke a leboga haholo!
Ke a Leboga!
Ndo Livhuwa!
Ndza Nkhensa!*



Lindiwe Grace Mahlangu
<Mahlangu.L@qcto.org.za>

Aug 28, 2023,
9:36 AM

to **Reuel**,
me

Good day

Thank you for contacting us.

I have copied our QA Unit. They will be able to respond to you accordingly.

Regards

Lindiwe Mahlan
e gu

Administrator:
Marketing and
Communication

Mahlangu.L@qcto.org.za

Switch +27 12 0
Board: 03 1800

Direct +27 12 0
Tel: 03 1867

256 Glyn Street,
Hatfield, Pretoria
, 0083
Private Bag X278
, Pretoria, 001

www.qcto.org.za

QCTO Fraud and
Ethics Hotline
FreeCall: 080011
1894

qcto@thehotline.co.za

FreeFax: 0867 2
6 16 81

www.thehotline.co.za

From: tshingombe fiston <tshingombefiston@gmail.com>

Sent: Saturday, August 26, 2023 12:32 PM

To: TSHINGOMBEKB TSHITADI <tshingombekb@gmail.com>;
qcto@thehotline.co.za; Lindiwe Grace Mahlangu
<Mahlangu.L@qcto.org.za>; contactus@thedtic.gov.za;
callcentre@dhet.gov

Subject: Re: Release resultat statement and finalize award
diploma./irregularilary case .re marker

On Fri, May 12, 2023 at 8:21 AM TSHINGOMBEKB TSHITADI
<tshingombekb@gmail.com> wrote:

This message is intended for the addressee only and is confidential and the copying thereof is prohibited. The above information may contain personal views of the author thereof and is not necessarily the views of the Quality Council for Trades and Occupations (QCTO) and the QCTO does therefore not accept liability for any damages arising from the correctness of the facts stated in this communication, unless specifically stated. If you have received this message in error, please notify the sender immediately and destroy the original message.

Verification Client Request Rejected

Inbox



CVSNoReply@qcto.org.za

Fri, Dec 1, 11:28 AM (3 days ago)

to
me

This is a QCTO system generated e-mail. Please do not reply to this mail.

Dear tshingombe

Please note that your request to be registered as a verification client was rejected.

The reason for the rejection is as follows:

As the holder of the certificate you cannot register as a verification client to verify your own certificate. Request the party that requires the verification to register with the QCTO as client or contact the QCTO for more information.

Should you wish to re-apply, please follow the link on the QCTO website to

register as a client and submit a motivation to the QCTO to support your request to verification@qcto.org.za.

The heading of the email should read - Re-application as a verification client, previously rejected

Should you have any question in this regard, please do not hesitate to contact the verification team.

Kind regards

The Verification Team
verification@qcto.org.za

256 Glyn Street, Hatfield, Pretoria
012 0031800

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CVSNoRe
ply

CVSNoReply@qcto.org.za

Swi +27
tch 12 0
Boa 03 1
rd: 800

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0083
Private Bag X278,
Pretoria, 001
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Ethics Hotline
FreeCall: 0800111
894

qcto@thehotline.co.za

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16 81

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QCTO APPLICATION FORM

FOR DEVELOPMENT, REVIEW, REALIGNMENT/ DE-ACTIVATION/ REPLACEMENT OF OCCUPATIONAL QUALIFICATIONS/PART QUALIFICATIONS/SKILLS PROGRAMMES IN LINE WITH THE OQSF POLICY (2021) OCCUPATIONAL QUALIFICATION TYPE (NOMENCLATURE)

NB: Only Quality Partners (QP) may complete this form

SECTION A: SPECIFY TYPE OF DEVELOPMENT REQUESTED

Tick the applicable box in the table below:

TYPE	DEVELOP	REVIEW	REALIG N	DE- ACTIVITAT E	REPLAC E
QUALIFICAT ION	N engineerin g				
PART- QUALIFICAT ION	n/ engineerin				
SKILLS PROGRAMM E	engineerin g				

SECTION B: QUALIFICATION DETAILS

B1. Occupation and/or specialisation that this Occupational Qualification relates to:

QUALIFICATION TYPE			
OCCUPATION/ SKILLS PROGRAMME TITLE	OFO CODE (state if none related can be found)	SPECIALISATION TITLE	SETA CHAMBER SIC CODE
		1. Panel wiring	
		2. n engineering electrical	
		3.	
		4.	
Link to access OFO: https://www.dhet.gov.za/Skills%20Development/Updated%20FINAL%20OFO%20VERSION%202021.xls			
Link to access SIC Codes: https://www.dhet.gov.za/SiteAssets/Publication%20of%20New%20Seta%20Landscape.pdf			

B2. Details of Qualification(s)/recorded Trades affected where applicable:

QUALIFICATION ID/RECORDED TRADE ID	QUALIFICATION TITLE/RECORDED TRADE TITLE	LEVEL	CREDITS	QUALITY PARTNER (QP)
	Engineering electrical	Lev, 5/n4	n	
	Panel wiring	Lev2		

--	--	--	--	--

B3. Learnerships registered against the above stated qualification/trade:

LEARNERSHIP REGISTRATION NUMBER	LEARNERSHIP TITLE	NQF LEVEL
	Engineering electrical	N4/lev5

B4. Does the intended occupational qualification relate to relevant economic drivers?

For each area marked yes, provide evidence

Referencecurrent source, with page number, where need was identified

Tick YES or NO.

4.1 Listed in the Economic Reconstruction and Recovery Plan (ERRP)?

Yes	yes	No	
Reference			

4.2 National Development Plan

Yes	yes	No	
Reference			

4.3 New Growth Path

Yes		No	
Reference			

4.4 Industrial Policy Action Plan

Yes	yes	No	
Reference			

4.5 Economic drivers in Strategic Infrastructure Projects (SIPs)

Yes	yes	No	
Reference			

4.6 Reconfiguration and Reconstruction of N4-N6 part qualifications

Yes	yes	No	
Reference			

4.7 DHET Scarce Skills List (List of Occupations in High Demand)

Yes	yes	No	
Reference			

4.8 Legacy/Historically OQSF Qualifications

Yes	yes	No	
Reference			

4.9 Other priorities

Yes	yes	No	
Reference			

B.5 Provide a rationale for occupation/specialisation (i.e. describe and explain need, benefit, typical learners)

...

B.6 Specify regulatory bodies, professional bodies, associations, labour or employer organisations and/or other stakeholders that are involved/interested in this occupation:

...

SECTION C: APPLICANT DETAILS

Complete the table

QUALITY PARTNER DETAILS	
NAME OF QUALITY PARTNER	...st peace college
NAME AND SURNAME OF APPLICANT	...tshingombe tshitadi
DESIGNATION OF APPLICANT	...
EMAIL ADDRESS OF APPLICANT	Tshingombekb@gmail.com ...
APPLICANT SIGNATURE	...tshgombe///
DATE	...01/06/2023

SECTION D:APPLICATION SUBMISSION

Email completed and signed application form to:

qualifications@qcto.org.za

FINAL VERIFICATION REPORT TEMPLATE

NB: This scoping report is to be compiled by the QP and is submitted to the QCTO within 10 working days after the Final Verification Meeting.

1. QCTO approved application for which the Final Verification Meeting was conducted:

OCCUPATION	engineering	OFO CODE	en	SPECIALISATION	n
-------------------	-------------	-----------------	----	-----------------------	---

2. Final Verification Meeting details:

The diagram consists of three rectangles on a white background. On the left, there is a small rectangle with a width of approximately 100 units and a height of approximately 50 units. To its right, there are two larger rectangles. The first of these is a tall rectangle with a width of approximately 250 units and a height of approximately 400 units. To its right is another tall rectangle, slightly further right and slightly shorter, with a width of approximately 200 units and a height of approximately 350 units. The rectangles are arranged in a way that suggests a sequence or comparison of sizes and positions.

4. Details of Part-Qualification for which Final Verification is conducted:

N O	QUALIFICATION TYPE	QUALIFICATION TITLE	NQF LEVEL	CREDITS
1.	Trade theory /panel wiring	Engineering n	N5	n
2.				

5. Details of Skills Programme for which Final Verification is conducted:

N O	QUALIFICATION TYPE	QUALIFICATION TITLE	NQF LEVEL	CREDITS
1.	Engineering electrical	Engineeeeeeirn n	N4/lev 5	n
2.	Panel wiring electrical	Trade theory	Lev	n

6. Analysis of stakeholders consulted for Final Verification:

N O	CLASSIFICATION	NUMBER OF PARTICIPANTS WHO WERE INVITED TO THE MEETING	NUMBER OF PARTICIPANTS WHO ATTENDED THE MEETING
1.	WORKPLACE PRACTITIONER	4	4
2.	PROFESSIONAL BODY/NON-STATUTORY BODY	4	4
3.	REGULATORY/STATUTORY BODY	4	4
4.	EMPLOYER ASSOCIATION	4	4
5.	EMPLOYEE ASSOCIATION/LABOUR UNION	4	4
6.	EDUCATION AND TRAINING PROVIDER (PUBLIC)	4	4
7.	EDUCATION AND TRAINING	4	4

	PROVIDER (PRIVATE)		
8.	ASSESSMENT SPECIALIST (EXAMINER/ MODERATOR WITH EXPERIENCE)	4	4
9.	CURRICULUM DEVELOPMENT SPECIALIST	4	4
10 .	TEACHING AND LEARNING SPECIALIST	4	4
11 .	COUNCIL ON HIGHER EDUCATION REPRESENTATIVE	4	4
12 .	HIGHER EDUCATIONINSTITUTION REPRESENTATIVE	4	4
13 .	OTHER	4	4
14 .	TOTAL	56	56

NB: Attach Final Verification Meeting Attendance Register in the QCTO prescribed format

7. Details of Subject Matter Expert who will facilitate the development of Qualification/Part Qualifications/Skills Programme:

NAME	SURNAME	EMAIL ADDRESS	CELL NUMBER	TELEPHON E NUMBER
tshingombe	tshitadi	tshingombekb@gmail.com		

Comments

...

8. Quality partner declaration:

I, ...(Name and Surname - Quality Partner Representative), declare that the information provided above is an accurate reflection of the proceedings of the scoping meeting as detailed in this report.

Signed on this ...02 day of 6...20...23 at ...jhb

**Signature (Quality Partner
Representative)**

Witness 1 Name :	posha	Witness 1.
Signature pl		

...

Witness 2. Name :	ps	Witness
Signature pl		

...

Dhet ,saqa,qcto ,scope teach learner

DHET , TVET /
college nated exam plan college
-Teach and learning plan 2022./2023
Lecture , dhet an St peace college internal external learner
Portofilio textbook.
Student learner name : tshingombe tshitadi

Lecture learner name

Re mark :

- Part 1 framework and conceptual underpinning of plan.

1. Purpose of the plan:

Planning examination national trade examination term and Semester in college framework ,module circular Assessment evaluation test 1,2exercise book learning faculties diploma national coverage time table allocation studies engineering electrical and engineering college peer assessment, self assessment and group assignment sub completed , in college and institute police engineering institute , qualifications implementation n diplomat saga frame work log activities and councils trade test practical .

- Assignment class work internal assessment and external Assessment college nated technical vocational and technical College, training college, coverage internal assessment. Problem based institutes engineering and institutes police Portfolio evidence.

Coverage engineering police and traffic police engineering, subject.lecture teach and learner.

2.Aim of plan : vision college and mission college and institutes examination subject

,basic advanced research and filling Engineering electrical mission ,planning school disciplinary area circular assessment police department

Input output policy orientation guideline learner college must design engineer, and analyze discovery job vision duet examination policy, and saga policy must meet. Criteria examination planning circular.

3. Objective of the plant: the exams national national trade department and internal external examiner assignment objectivity learner to qualify and learner the end of examination should be able to correct to implement to label to retain and restitution faculties any criteria to improve to take measurements in different ways of engineering electrical.

4.Conceptual underpinning of plan

Lecture and learner planning course class model design, module, and week completed exercise book. time allocation:

Framework regulatory. Engineering studies business Engineering location

5. Underpinning philosophy for delivery of quality teaches On and learning in TVET college.

Teaching.: Report self sat and Pet assessment St peace college internal external term was 3 month qualify Engineering studies business diplomat internal diplomat was record report certificate years, completed scale internal test class work homework record years assessment completed filing Portfolio evidence topics coverage lecture note and learner self assessment and peer assessment critical objectivity learner delivery, lecture annual report principal and rector at examination external. Statement of results for registration attendance regularity or irregularities learner report process learner theory experimental and practical for n diplomat studies business

engineering n 1,2,3,4,5,6 years lecture and professor doctoral work textbook and class work reading and professional orientation vocational examination trade subjects and Engineering electrical subjects , College St peace policy guidelines for Poe s works years memorandum exam.

.-6 Key delivery areas: in the plan.

Statement and certificate coverage compare marks years college and institutes and test class work 40%, 60% exam statement criteria plan module 3 month Engineering electrical subjects research.

-7 the embeddedness of the teaching and learning plan in college strategy and operational:, research in college and institutes focused examine evaluation was undercover lecture weekend and learner weekend,

-8 Implementation and monitoring of the teaching and learning plan topic, trade engineering national work research Assessment completed year's methodology criteria research textbook learner.

-9 reviews and adaptation of the plan in successive, the planning submitted on internal and external sat learner and teacher nated ,seta engineering faculty St peace College completed time table planning, completed Time table orientation principal: circular Assessment evaluation design engineering electrical faculty engineering time table learner policing and college operational time table period movement time morning to afternoon daily weekly move job circular years design development system, subject engineering electrical and information to. Business Engineering. to national trade , subject reports

Orientation

10.Addendum not completed response :

-College: St peace college and institutes Affric police.

-completed by : tshingombe tshitadi

- designation:

-Section /output planned activity//report///corrective measure////

targeted date completed...

<u>Section</u>	<u>output planned activity</u>	<u>//report</u>	<u>/// corrective measure</u>	<u>//// targeted date completed. ..</u>	

--sect: work placement, student and lecturer.

-Plane g output , activities/verification minimum//evidence///responsible
office design////activity
output completed/////activities output not completed //target date for
completion

<u>Plane g outp ut</u>	<u>activiti es</u>	<u>verificati on minimum</u>	<u>evidenc e</u>	<u>responsible office design</u>	<u>output complet ed</u>	<u>activities output not completed</u>

- Program in renewable energy offer/enrollment programming
- College WP student adhere // update college policy.
- process in place network identify industry, action plan ,strategy plan

e

2.purpose:

.QCTO: Occupational qualifications skill programmed, development report required qualifications documents final verification meeting.

1. Qcto approved application for which qualifications.
- Curriculum template, CV report 10 days after CV finalization.
- scoping report template compile 10 working days after the meeting...
- St peace college full time class study practic,national certificate n1,2,3 any content mathematics electrotech,logic industrial study career field engineer electricity electronics and electromagnetic Engineering dynamic field engineer responsible for generations transfers and conversion of electric power these after engineering are demanding posit industrial ,,,qualification to equipment yourself basic electric to ,star CCTV business use CCTV,camera, monitor fixe indoor outdoor ,,
- design planning, research advanced field, undergo planning system skill planning system skill planner next, development skills components, science natural mathematics. Chemistry device protection components, ensuring maintenance. Are components, discovery skill, idea improve, inspect find fault.

.1... Trade test QCTO...saqa

criteria measure the power of learning trademarks of Education testing services;

- **prepare for criteria Assessment test:** cognitive exam skill test personality assessment job test prep... discovery practical question ,score report,full explanation, review amount ..
- Employment for learning and teach lecture test service, test design...college business class work.
- engineering electrical aptitude 30- minute test designed ,criteria skill test ,test criteria exam consist question marks typing 1 minute test measure trade theory electric ,mathematics, Engineering science,, panel control wire .test installation item drawing electrical .
- Minute...

- prepare criteria test :
time table anted

- Trade mark holder property:St peace college workshop class works...

-Licensed electrician' s Assessment

Apprenticeship. Passing assessment category(y(.LEA) 15 minutes

-like seed electrician's theory. (LET)...

-the licensed electrician practice (LEP)

Practical test sleet wiring a meter box and switchboard men system test identify.

- **Comment on Licensed.** Week basic licensed , week number reading comprehension test , numerical reasoning test spatial science test.
- Trade apprenticeship aptitude test, time test, questions, pass score .100marks,
- Iron works elevator industrial...

- mathematics problem reason give day work produce,spacial ,,
- Mechanical reason problem, tools electric circuit point, point, physic question force,
- company electrical trade qualify question theory apprenticeship, class book electrical theory DC ,AC voltage converter cycle ,motor efficiency symptoms, phase ,Val apparent power current calculation properties operating , electronics operating principle test for Dios , diode rating replacement value ,
- Construction soldering connection, power transform...
- trade o ejective install troubleshooting cabling communication,
- manufacture companies :
Site ,plan ...
- Customer date completed.
- determiner later and install and tear patients care system installing conduit component and verify, operational system ,accord install and ,test security system test selected operating measure .. outcome trade engineering
- test anted Assessment required task ,step ,input equality operational basic advanced plant mathematics differential derivation fundamental theories low ,, Operational linearity system equation system linear process force ,limited , different fabric force , ,,linear AC,DC, semi
Code trade.

QCTO:

3.Purpose: of course daily course tender provider service require trade ,skill report ,phase ,1,2,3 trade test readiness close report . weekend attandat.

-tender number

1 .module / code // module object/// code criteria.

- inducty soft hand tools /recall application man power / relevant coulour marking correct sabs /// recall the operation diffet type module subject correct .

Conductor,joint conductor ,crimoingsoldering prepare,soldering fault find control panekcontact,

,Correct test instrumr, db fuse AC motor control short circuit ,single phase ,mecanicak fault ,fluorescent installation ,phase squirei motor dolautitransi , commission transmission, transmission generation,measure, Electronic compont resistor electrolytic diode ceramic diode transistor thyristor triac ,stable vibratory wave average , correct manufacture,

- chain block shockl max works not exceed , // correct cable gears relate years certificate trade clear time frame , training plan..

- company theoretical mathematics subject certiy,module check all settings

4- purpose :

and scope:

saqa , qualifications implementation , statement submitted, statement of work experience,

I'd transcription meeting 71638, primary status registration saqa Assessment 0912 saqa instuty ,30-39 , assessment policy IE099-IEOO, regulation internal saqa decision advance intermediate phase teach , ... agreement ..

Training reg ,com 182609001 seta

Dhet exam id 210002023812, I'd 2004007064381,,...

Assessor award degree diplomay number not meet and institut award 202303115021 submission numbers,

, N diplome engineering statement

Of work , saqa I'd 90674, NQF level 6, 360 ,saqa learning 67043, .instruction . statement .

N1,saqa I'd 67109,n 2 saqa I'd 67375, saqa I'd 67491,

- evaluation assessment

90674: national n diplomat engineering..

1. Qns .Where appropriate applying lubricant correctly to assembly in accordance with specifications and standard operayprocedure...

Required , where appropriate applying packing material in accordance with specifications standard operating procedures, ,inspection final ,assembly conformance , where appropriate returning final assembly to use , diagnose and repair analogue equipment , obtaining and following relevant circuit diagram Manuel schematic ,maintenance record ,locating diagnostic built fault, obtained code interpretation documents,tuning test functionalite and recording fault and equipment , checking electronics equipment assembly,component connection ,

Removing and replacing repairing components from electronic , recording test understanding on electronics , isolating electronics assembly from power adjusting , calibrating electronics equipment ,returning to service testing to specification , returning to service and test to specification the repairs electronic equipment using language and literacy provide, using langy skill , equipment fault find ,reproducing symptoms and verify g ,maintain see ice digital electronics ,look for evidence relevant circuit diagram Manuel schematics maintenance supplielocati g record build ,

maintenance error code interpretation documents running test
function ,checking removing and replacing components,, interpretation
technical drawing looking evidence checking the drawing
againg ,procedure interpreting information drawing writing documents
checking clarifying , understaking numerical operation geometry calculation
,terminal xonecct ,check material connection and regularity
requirement ,adjusting and fixing wiring, marking,rigging labelling
connection , undertaking testing connection for conformance ,component
test AC 15000 volt ..

Marking component disassembling , settings up appropriate test and
calibration equipment, setting the controller mode system , completed
report commission the control interpretation information ,,

-1.1 ans..How to apply for job research hiring compaignies trade nated to
qualified workshop and to council lab workshop school experience time
table counsulta,subject reports ready resumes submitted job oersonnek..

- basic in Quality inspection check variable appears understand quality
experience.

Trade ..

Manufacture inspection , pulling random ,checking product Gain ,verify
packing required,shipper packing check point dimension shopper ,check
instruction measure chipper gross gives value ,measure cartoon gross
weight and compare , shipper material layer sealing card singy, critical
defect fail inspection ,,

- maintain repaired electronics planned maintain scheduled ,
multimeter ,resistor inductor components testing using ,soldering technical
basic , circuit board fault finding finding electronics instrument and system
mechanic,, .

-width of panel size terminal side switch ,size for component depth ..

- responsible : original documents it document review obtained number prior
to Dec routine assure that document sraft DC number checking log
documents entering ,,

- material drawing afoi g check appropriate charts list applicable calculate
formulr , installation drawing provide how compagny position , Assem ly
drawing exploded diagram model schematic ,machine drawing ,machine
shop drawing ,expertise order to create machine ..

<div></div>		
---	--	--

DHET...

5.Purpose:

Completed time table implentation coverage Summative regularity,
subject n1, n6, asservissemnt task assignment homework, marks allocation.
310x 6 , module , content module scaling. 100 marks , student program,
asssessment tools marking memorandum ,
Isat.icass continued assessment ,
-Body quality insurance re certificate rating low,
..outcom scotiss qualifications value Assessment Portofilio I Engineering low
teacher lecture judging evidence ,subject Quality Assurance, the completed
solutions, recorded programs assign short ,re- assessment develop
Engineering , analyse Proibly, designing a straight problem, simulating or
constructing ,

candidate class	part question	operation el skill	reasoning skill total point achieve		

- candidate class /,part question ,//operationel skill/// reasoning skill total point achieve,

Mandatory skill development course analyse staring , ,d..

Topics ,nated levej subject module..

- applyy math skill to manupulr low and working skill , cLccul ,

Applied Engineering electric skill analyse .. administration information.

, description of charge, authority ,

Conducting the assessment: high judging evidence internally marked and verified , re - assesment unit assesment ..

- Question / point of process or accuracy //expected responses
- checks length correct conclusion/ evidence correct reason other draw..-
- / evidence of appropriate add sub correct ,
- Correct answer..
- eviden e module total examin ER composite ,overall strategy square ..
- totalprocessand accuracy point for test total reasoning....
- isat integrity icass assessment subject .
- Conceptual question problem hydro electric generator concept assuming unit, conversion wath current ,
- integrated concept lighth trading concept cost heater , power

Dhet...principle and practice purpose value work component engineering national ncv n engineering, scopet integrity engineering electrical level 4, and n6 saga n diplomat examinaty.

- Scope of...isat
- Topic mark engineering trade anted and nave.
- Produce, operate component driller.
- sub activities task ,time framework time allocation ,
- 1 manufacture size weight scale power specific, / time.
- Total.
- resource requirements

.
Tools assessment, material...

.

- topic operate and

- challenge n diploma duet vs. saga diplomat vs. Vs. anted test council trade reasoning teach learners theory practice learning value assessment.

6.Circulum: value add assessment ,is or is not subject to changed, Saga engineering...resoningvs counct vs NC's level electrical infrastructure dhett principal theory practical vs ,NC's matric teach learner assessment

exercise book technology electric vs, instituts engineering electrical,,, drawing Diplomat math engineering science drawing evaluation trade theory electrical engineering ,step dismental, step dimension works vs in AC machine theori instruction operational requirements algebraic, step qualifications rewinder vs council trade code ,trade minimum ,test resonement low ,test , occupation trade vs quality insurance Engineering , AC ,DC machine ,topic foundation, system ent level AC, vs NC's matric seignoy technical princy AC ,logic circuit math investigation quadratic exsry , input lecture output vs xircuy, trade scht vs code tender instruct,vs Engineering ,code trade minimum, knki manufacture batterycorrect , constructeur installaty circuits grade safety technologie ,nsaaa step work daily acti understaking material package mainty , assembly panel, labelling battery AC , DC, cabling soldering control competu compagy phase ,

- nated base Norton the venin network, resistance parole series start parallel start delta resear ,advanced field ,dial Deer distributysystem substation vs basic sub station trade VCC,ICC advance physics chemistry engineering ..

Memorise ,torrseafy advai field but work week basic field electrical under going research ,

- scope diplot vs advance field dhett machine transistay curixuy phase policy mathematic asic field d,

- component job institutor low fundamental AC research AC research ,package low degree ,saqa n6,nqf7,78, degree technoy electrical outcom news , understand experience component didacy AC, DC,psychometric pedagic ,

- evaluation saqa memorise evaluation prep trade test vs. monorise vs memoremundum test test circy literay,lecty learning ,Sawa meet reat lecture nated nated ,vs teach learner instity fundamental working compagny, Engineering : scope work project.

Irregularite semesy policing Poe's award years self meet achieve textbook n submitted, 2000 award policy submitted papper for completed, previous papper discount.

-completed textbook information after achieve DC machine Levi transit advance systeme completed , resposable ,exam holiday memo vs saqa vs is chat to win court , Engineering city power tender to Portofilio low rules , Portofilio city power experimental job,Shoprite experience but sales documy wallets account treasury ..

- memorise nated instructywas to doing to rwiten ast no study buy opery theory , ciproc ,sars nated council business cooperation work nated lectt copyright and visit studi labour pliyay permit to entry schot busit. Lose colrith process casebook ,sars calender busiys hool college in case with dhett deal .memorise markets textbook, memorise sale book sars commission property intellectual de register dhett high educare permit .policy exam national copyrith re mark book bibliogray reference number to mutch

years

- proficiency colrith educare education system note book didacty lesson plan
course inventories research methods model lesson plan , business markt
businey comments book note order project book, module week was not
bring market scaling reproduction project learner

**6.1. Assessment coverage DHET ,saqa council,,
Subjects :project assessment.. and career mentoring research
coverage faculties completed module,**

- project title : engineering national trade learner and lecture technical
vocational department higher education examination national and
qualification Framework national ,council trade and council engineering
trade test question papper project modules explanation low rules exercise
book, completed outcom project society.

.education construction and project bridge keeping stability journal thesis
stability civil engineering,and mechanical engineering and electrical
infractute

- psychopedagogie engineering civil outcom technologie ergonomic, ,
1.Project construction and project management,investigate wat key
national road conduct study feasibility assess viability upgrading existing
route and the construction of new or by pass route , investigation found
freight, municipality area . Light

1.project description:

Extension from education n DHET Education to saqa council Education
ways distance learning , infrastructure asset, a grade separated .

Strategies construction elimination abnormal educare loop ramp load ,
bridge .

Bridge Education,bridge substructure piled foundation abutumebt front
Poste tensioned voided deck superstructure bulk ,design of layework make
optimunmaterisj ,

- problem encounter and innovation,

- piling tender temporaries ,archeological ,

Pile cap, temporary deviations by pass, stop along , empower target,

- Project status: construct, chalkeny, inspection survey, safety educate.

-case study testing implications , to conduct to detail design in order a
cuss road mining , accommodation up grade,

Client requirements, pavement,

Layout of trial section x,y lateral restraint ,increase nearing capacity
creasing length of shear tension verification geogridr static plate load
testing falling weighting deflectimeter were used to verify the effect of
geosynthetic ,

- present research: traditional geosynthetic reinforced weakness subgrade
and Normally increase ,penotometer testing engineer later works,

Project description: resultat from,presure depth,project progress, strain
material n/ mm , anchor tension force , equivenlent rigidr , flexible

baseplate the propose construction programme duration.

- cross section bridge structure, beam seat, concrete panel facing , reinforced,select backfill ,common ,

Extraction of durability subcontract yield stress, ultimate stress MPa ,bridge abutment ..

Framework bmodern labour construction public work program leading to critiques of infractuture sector expand public b,construction maintain, Council nomination, project layout structure ,, ,

- project description: test site capture data km track Struct deflecty railway train wheelk linear teanst steel , position track structure, resultat discussed.

3.dhet mentoring:

Outcom career saqa maq

..education career mine geotechnical agreement Agricole sectorial engineering mining qualification authority mining and minerals sector . understaking electrical material mining qualification career mine workforce.

Mining sector , why choose career in mining minerals sector , ,

Career mining choose a career how to make a career choice ,

Critical cross Feld skill required mining sector , problem identification and evaluation, problem mathematics literacy , planning career in the mining and mineral sector , wath career suite life choosing qualification,

occupational categories technician trade workers ,machines operayorx

mainstream career , understand qualifications, artisan career option mining

minerals , career,, professional career ,laetber paths career ,financig your

studies,,gold platinum metals ,diamond,coaj,cement line, jeweller ,extract

petroleum and gases,service incident other ..

Bridge catergor

- keep bridge indentification number carer opportunities occupation framework occupation level n qf , occupation categories ,1,2,3 elementaire worker, machine operator,technicia trade , manager profrssy, production

-

-

7.1 Purpose dhet : ,, Education input out put

Subject mining examination , safety health labour mining police.

Outcom ,mining examiner national trade , explosion mine ,

discrimination mine .

Trade AC ,DC, mine machinery.

.7.2. purpose nated career : bridge static stability briage movement phase periode frequency stable way phase to phase job Engineering

lecture transition phase

- psychomotor job analysis functional rate class hrv constructy woru saw building task tools must up date collective ,function real word student function machine student rule input output the class function rules teacher created spread , gradient a vector function gradient if scalar $f(x,y)$ (arrange partyah, stability construction isostatique diagram force structure hyperstaics beam ,regulation commissair,tools form stable trade nated engineering subject , assessment task build ,mark allocation ,content average , asservissemnt tools ,point balance framework structure stability..

- instability system development bridge statement periodic 3 month way key learner break time table semester maintained up grade up date .

. Teaching plan daily underplani g phase foubda phase intermediate seignor, staff lecture ,junior seignor principal lecturer Engineering trainee circulum vocational subject .

Time table general signal linearized $x(t)$. Control didactic process machine key learner input out put loop variable subject $x = ,y = y(s(x))$ discretion signal temp , instant ,energy power time continue $R+1$, jx ,power ,,

- transformer Fourier control didactic time table $x(t), r+2dt$, counter measure frequency content sum , property $x(Q) + ,$ property lineaire time table input output , real time table ,derivation note time table $dx = St, TF(St)$, , integra, impulsioin diract time table uniform impulsioin retention xt expent time table , , complexity time table loop ,

- transformer Fourier TD $\checkmark(x,y)$, ,filtre lineaire box lineaire circuit transfer input output $(s), x(t)$..

- regime transitaire learner phase and teach system linear $u(t)$ system education stable sponement stat equilibrium means system input out put loop Kirchoff constants transmittance , signal course modulation module week output modules course type trade phase -test readiness

b.test scale maps distance learning corresponding learner concept distance learning graphic scaling size generating km learner distance , scale weigh learner grade real m square space scal factor point ,accuracy mesure survey , degrees latitu ,geodesie projection cartographic board coniaye,, isometric learner plan circulum ,latitude circulum implentation,perimeter circulum schema sequence circulum phase , transformation coordinator geographic circulum policy real engineering, longitudinal meridian ,exposant projection,constant projection p,coirdinat projection examination circuit dhet vs qctovs saqa scale ..

- probably..

-movement phase vibration force oscillator learner, input out

-Low rules of conservation of energy learner circulum policy, engineering move mechanical kinematic energybkEvwork done conservation force ,step determiner system Education , potential conservation input out put teacher , $kE_i + PE_i = kE_f + PE_f$,step 4 , step phenomen bbeam energy breag,,

Efficient learner ,useful energy or work output ,total energy input, transformer per phase energy phase learner,,

Activity learner device home work scall effici, process kinetic calculate gravi learning linear mecanic,

Frequency constant capacity static displaced,resonance frequency learner

materit Curie ,Piezo electric voltage,,

- robot dynamics kinematic control learning teach plant scare , position coordination lineare , circulum velocities Cartesian circulum move phase learn, rotation matrices activities passive rotation ,elementaire phase repressat, generality task space classic , body acceleration effectuator ,x y,z, angle ..language machine education funct ,from matric mild learner process ...
- induction learner error resource machine educau..matrix time table line colonel movement weekend months build key ..form work job career .form saqa form dheth ,for qcto language matrices movt 2week ,3 month ,12. ,2 years qualifications experience language matrices deployment years compared , circulum implentation to the college and instituts form moved record exam internal external time typiste record archfile statement certificate,and diploma..fabric system.

8.1 DHET, vs seta merseta sassetta training Accreditation training,

8.2 Purpose: manufacture relate theory practical, components equipment,

- trade ton max,chain load diameter.

- trade ; code objectivity criteria.

-electrical testing instruments, safety and faulted find ,system multimeter insulator leakage tester phase rotation tester.

1.correct test reading all safety rules ,armored , make standard armoured cable up 16 mm sq core volt glandess ferrules and lugs use to manufacture specifications ,join to mechanical CA2, indentification rating current voltbCA4 terminal PVC cable up to 1209 entry into cable end viz using mechanical compression methode correct according sabs 0142,

- installation of machinery : install and level compressor motor a machine part on a fabricated base ,,

All safety aspect adhered to ,no damages to equipment,level withug ,,

Install commercial refrigeration system capacity 19kw refrigerator include pipe work according drawing specific ,single phase induction motor ,phase squirrels cage induction ,rotation correct ,correct ,,trade fault fault fa control find , control panel and motor control all safety aspect adhered sabs , correct test ..

Vs .

1.2. Circulum extra subject electrical energy , industrial electrical ,electronic

Engineering trade theory vs practical

Module energy renewable.

Electrotech.

-thermoelectrical cooling , Peltier low relate manufacture.

Cooling air conditioning modules, technical controller product , coefficient of performance,thermal design, DC current vs technical power supply type,

- recommendation of the manufacturer , comparison of two technical controllers ,,linear vs amps ,,I/ max derive dt ,25 k ,0- 0,33 , I/IMAX should middle , 0,33 -0,66 x IMAX ,, coefficient of performance (cop) ,, .. performance vs current, maximum temperature,warm ,cold ,is increased , thermal design,is crucial allowed ,
- thermal design , performance of system, reducing optimise hear sink fan ,power losses isolates area , Peltier elements,, Dissipation warm side , $Q_g = Q_c + P_{el}$.
- $I = 30 \text{ IMAX}$..
- heat pumped vs current:,, $I = 0,3$,, I max ,AC)Qmax , ,,thermoelectric thermocontact cook eratiin DC vs pwrt , maintence ,
- recommand manufactt ,limity current ripple regulatit output ,
- ferrotec , 19 Perce, engineering controller DC curry case manufacture,,power compare..
- Comparasuon of two controller. , Stability to work.
- design process: thermoelectric, estimate heat load interactive test parameter is amount of heat absorption, power dissipation radiation , conversion conductive, dynamic (dQ/St load transfer ,choose Peltier elements ,,

-electrostaric ,electrodynamic, electromagnetic physic industrial electric engineering physics

Heat rejected vs current control play heath thermal hear sink estimate aths

Performance vs current I / max St heat pump,, heat pump vs current ,
 $A_{\text{max}} = Q_c / 0,25$.

Temperature sensor ,object high precision ,power supply requirements.datasheet control information input

9.1. Dhet vs ,seta merseta sasseta,vs saqa.

9.2. Purpose: all the safety and policy

Defense civil and military safety outcom assessment.

Manufacture relate theory practice , engineering learning

- purpose STD 1285,, fuse holders lighthning arrester , electrostatic discy. Scop commercial and military electronic devices required no stated merseta seta no status to section mandatory , gov gazette etc EIC sabs correct.
- application documents: sabs iec ,,general requirements sabs EIC mil norm ,
- D.3 functionalite marking :mil,sabs ,EIC sabs ,
- terminal identification: acquisition documents identify together functionalite line,load instrument ,
- other marking electrical diagram caution marking caution marking

alignment marks, assembly instructions and other marking ,

- electrostatic protector confirm method where size limitations not accommodate all of the marking , requirements order of ,shall apply,
- identifying number sabs sans ,EIC in mil safety code trade CO1, ,, mil
- manufacture source code ,merseta mil ,name trademarks merseta sasseta seta. Mil STD , current rating when applicable ,date code when applicable , other rating and marking ,code method color coding telephone code , merseta colori,,
- Dc breakdown voltage shall be xolor coded ,dot accordance method , except that color circuit breaker,line a,b,c load a,b,c marked ,,main terminal break shall be marked vertical, accomodation letter , precedes , polarity thermo static switch FSC 5939 mil rotary sequence is counter clockwise visibility , acquisition ,open frame construction switch marked construct color pressed moldings , punch identification,
- toggle switches : toggle switch terminal marked in accordance, termination identification, identification push , contact arrangements symbol and terminal marking, single form normal open ,close ,,item specifical space contract number date serial code merseta ,,
- used unit pack bag and ,procuring activities physical space is not available mark mil used,
- designator for part assemblies : designation marking process to IEEE marked ,, sabs sans EIC mil

Reprocurement: contract contract , used assignment.
Details required.

Electron tubes: type designation or number type marking sab, ,labej mounted merseta seta sabs visible ,mil

- electrical electronics part printed wiring board marking mil STD 1285,,
- name plate data ,sabs article mil data confirming applied .. sasseta merseta sabs correct
- mil STD intended use ,issue of discuss,marking for shipping sabs, serial number sabs sabs merseta code mil ,air transportablr item , reprocurement sabs mil , subject term key listing ,name and caution plate, caution plate sabs merseta seta sasseta , mil STD , priority of identification information Assessment ,marking process,,
- drawing engineering code gage code format size letter mil sabs number system ,
- design activity gage code drawing numb army tank automatics tank wareent number sabs ,size cage code scale ,unit ,
- pin number length contractor manufacture item not change original,defense logistics battle explanation ,record accurate number number duplicate , responsably Engineering transferring design from design to another ,sabs sasseta seta add cage original identity , maintain design activity activities b, manufacture,pin item meet ,tabulation assembly installation ,source control delineat ,,
- design synthesis : sabs merseta. , Mil

8.2 .Dhet ,vs sasseta seta accreditation, Assessment.

-mil STD , safety security training, merseta required.gov gazette,

Applicable ,: document , general engineering n studies

electrical engineering.business studies,

Government documents , specifications other government drawing
engineering and Engineering science subject safe , order of priceden ,
definition commercial and government entities gage shelf , contains, design
activity engineering electrical , documents ,, functionalite marking
engineering electrical joint electronics type designation system engineering
electrical subject n ,manufacture identification engineering n diploma , nati
supply code for manufacture n engineering electrical trade merseta ,,
nomenclature,order of procedt, part identifying number pin engineering,
procedure instruction manufacture number ,set select drawing general
requirements, government names join electronic type design system
nomenclature ,army nomenclature binspection stamp ,special characters
contractor entity gage identify marker equipment, except to table ,unique
item small item ,limited multiple item , reference design government
reprocurement, details required,type number and design,electron
tube ,electronic printed wiring board name plate , marking battery circuit,
marking labalk ,high voly notice , radioactive matery sabs merseta, ioning
radiotion sabs , caution sabs , schematic wiring and cable sabs San IEC
diagram , chassis identification, modification work numbers
marksabs ,sensive electron device sabs IEC , sensive of marking ,general
type number marking process ,wood sabs ,size labals sabs ,material radius
corners mounting sabs ,spectral glass sabs IEC , opacity sabs
EIC ,permanency durability sabs EIC , note usur did ,marking for , air
transportable , .

-2..introduction system management,process , required analyt ,
functionalite analyy, verification, system engineering process, system and
control breaker review trade studies ,modelling and simulation metric risk
management.

Planning organising, system planing product and integrating system
development,

-3 system engineering. Electrical teade

fundamental introduct , subject , application work experience, definition,
facility ground system:

- power distriy system sabs EIC to mil , communication system , bonding
shielding and grounding relatship sabs ei. ..mil grounding safety practice
sabs , lighthning discharge fault protection noise sabs sans , summary of
requirements, resistance required sabs San,resistance to earth sabs sans
department defense SANDF communication electronics requirements,
typical resistive environment effect,neasyof soil resistivity,one electrode ,
subsystem ground burier gride sabs,resistance properties ,simple isolated
vertical ,fLt potential,, lighthning protection, phenomenon lighthning influence
,strike holder structure less protection flash ,conductor impedance
effect,inductor impeteaeth resistance ,basic fault protection fault protect ..
Vs

Saqa engineering electrical learning,advany maintence low voltage fault

find , batteries,low voltage inspect service maintenance battery charger ,
 designing a lone renewal energy systems, design solar pump trouble shoot
 PLC,completed certificate competence , demonstrate understanding process
 communication system,control electrical network a control centre,spray
 wash energised high voltage network, fault find repaired DC power
 machine,operate on high voltage network ,select up generator for
 renewable energy ,fault find repaired electric system winder
 installaty ,construction

Area 7,

Electrical infrastructure level 3 area ,-

-inspect record report condition medium voltat station appropriate,test
 maintain high voltage isolator ,earth system, transformer,
 equipment ,commissy terminate ,,install commission terminate medium
 voltage joint medium cable dcmachine,mainten voltage switch gear ,,fault
 find system conveyer install ,mining fault,construction
 disment,overhead,special area chemical , interpretation State, maintenance
 busbar and chamber association equipment traction substation, 3 kV DC
 traction regeneration traction inspection record ,breaker ..

--Vs ncv vocational isat frame activity

construction electric . Learner

Practical theory electric principal ,introduc ..

dhet , diplomat engineering electrical,, electrotech, militaire over , defense
 award challenge Assessment meet defense,,
 Electrotech , select power of electrical appliances to achieve set
 temperature,carry calculation ,convert mechanical energy to electrical
 energy. , determined the amount energy installation in termine kwh ,,
 determine cost installation AC ,cost incud , apply vasic magnetic theory,
 determine magnetic flux density for magnetic, interaction between
 magnetic field, AC lines of magnetic force ,flux MMF, interactive between
 current carrying Maxwell,non magnetic relative MMF ,motor left ,theory
 faults of switching,, determine energy stored,calculate length,
 principle, ,,compare diffentperiodi. Time form RMS value a stage,value
 maxitprak additional, explain singlt and three phase system comparison,
 voltage number calcutlind phase , demonstrate calcul diagram the
 operationel circuit, explain apply purely ,,explain effect having poorfactoe
 capacitor, AC penaltieable size equipmt size current demand,running of
 induction motor on full load synchronouse static delta star , description
 transformer determine efficient no load components ,transfotcore ,type AC
 air breather conservation buchils ,core lamination , emergency stop button
 warning caution ,,state installation procedt consider all safety precautions
 application non service generator set , consider all safety ground condition
 state ventilation noise define refueling access, in AC commission the sets
 preparation insulation plant proving test suplyis correct installed,all cable
 are secure and correctly connected,the sets correct out electric ,state
 earth , connection from non service generator set switch gear equipmt AC
 check load cable and interconnected,chech the earth operate non
 service,identify generator,applyloD in accordance with safe working check
 and adjust generator set running ,mainy voltage ,shut down generator,
 carry out after use check in accordance completed recomat, maintence non
 service generator set maintain principal procedure,apply all safety
 equipment,install non service distribution system,install distribution
 cables,install distribution units feeder pillar mcv,rcz ,install operate and test
 lighthning and power distribution system lapds, statement design,ensure
 correct placement fixumaterial task, ensure task is installed to line,ensure
 task requirements adherapply electrical standard,ensure compliance with
 and enforce all regulatoriij, evaluation thee executive m e electrician task ,
 implementation safe work ,,
 Selected appropriate switch gear ,determiner capacity switch gear install
 diagram,manufacture local distrtpoinr , manufacture data protection,shirt
 circuit, diversity, maxi demand,connected load ,selected type wire identify
 system ,determine adequate capacity basic , protect

Dhet ,vs saqa labour mine ,

-Purpose:for plant engineering examination the theoretical section
 subject,theory practical,

Electrical,mechanical,,safety and management ,accident prevention ,fire

protection risk control , project management,project financial loss control ,
 - electrical technology, DC current machine.motor generator ,efficient DC machine efficient of DC alternating single three phase circuit transfo, production of rotation magnetic, character synchronouse three phase inductmoyor ,semi conductor ,electric lamp and illumination,electric power transmission,short circuit condition ,circuit breaker ,cable insulator overhead, power economic of power supply,maximum demand ,fault discrimination systemeteical fault ,illumination exploinsion equipment,,
 - applied thermodynamics : air and gas compressor and blower,air motor refrigeration and property air condit,psycho entry ,steam generator ancillary ,heater balancing , balancing condensatir steam gas combustion heater transfer fuel transfer , simplestress, strain thin pressure vesell tension pression circular, close coiled shear force vending , temped ,strain second moment bendut shear foundation, fatigue mechanic,property,testing material twisting shaft property, reinforced Crete, conveyor wind plant ,elevator traction ,motion , displacement and acceleration,static dynamic ,belt and chain ,brake dynamic, toihead gear train lubrufian clutch cranes bearinghydrattransmissiin flow friction losses,material transmission pipe line ,Pelton wheel,flow in kaudnes, hydraulic machine ,mecanic measure air flow,dusting property, Commission safety maintenance condition.
 - planing and commission of project maintence schema fire detection system accident investigation, testing and repair electric motor phasing and synchronous AC motor operating tandem fault discrimination electrical,hydrastaic drivers classic sequence general, dust suppression,emission control flameproof,boiler inspection repair inspection vrsei unders pressure, maintence fault diagnosis compression refrigerator and air conditioning ventilation system steam pipes water traps ,steel rope inspection application type,

10.2 DHET, qcto scope, saqa sassetta.

Outcome,

-10.2.1PURPOSE: engineering science, module completed, algebraic linear basic foindamental system process fabric learner engineering science , theory theorem fundamental research,step task

Learner lesson plan lecture plan mapping investigation analyse input out put subject module assessment

$f=ma+mg$, $v=u+at$, $p=wx.t$, $F_u= ft$, heat = $m.a .cxt$, equation algebraic linearing exponent , $Ax + by=o,,ax.ax$ b.b $y=,,$

-fa.a +F.b.b , fa.a+FB.b=c.c(x+a) exp .n

Subject Engineering electrical applied

---mathematics ,(1+x) exp n=1,--+ Engineering science $g= ma + mg$,

$v=u+at$, $p=w.t$, $F_u= f/t$, heat = $m a.x .c t^2-t\#$,

Engineering draw .. orthographic orthopedagogic educare education,care

function.

- industrial electronics, $v = r.i$, $e = v + r.i$..theorem equation loop ,
Trade theory $v = r.i$, $e = v + r.i$, // term 1,2,3,90 days, ///mark score point 100
mark,////inspect policy stolen excy///// recalculate error developm theory
inventory motion low formula pedagogie fundamental engineering
phenomenon low motion ,

Exchange policy investigation resolve framey regulatory engineering
compliance crime vehicle ass license number low, step collationing crime
information legal paray, crime source information identifying crime
described crime analyse crime ,crime no protect over load identity module
subject completed source and need ,design analyse feedback criminals
trade theory safety .

-engineering safety engineering completed design creation components
safety management prevention low warning protection device incidey hazay
acciy ,sab sans regulatory low motion $F = ma + mg$ // Engineering
labour ,inspect labour Education levy coid works relation collection
misconduct fault award ruling compensation frame accidt , $F > ma + mg$,,///
engineering policy framework regulatory implentation legislation
informed. Claim assess indentify claim avai procedure case $f = ma + mg$,,
complain $f > ma + mg$,,

- test trade vs test dheth nated class question theory test ,

Test score mark subject, mathematics , engineering science, industrial
elec, electronical ,total value test engineering y/ evidence low given
explanation low low rules limited $\lim_{n \rightarrow \infty} (1 + 1/n)^n = e$, $\lim_{n \rightarrow \infty} -b + \frac{b+4ac}{4a} = \frac{b+4ac}{4a}$,
 $\frac{dy}{dx} = 4x + 3/2x + 2$.. into..., $F = g.m.a.m.b/r\#$, $p = r.l$ stregy module
elast , $f_a = F_B$,,/// $v_c, v_r, r\#, r_3, r_3$ Kirchoff northon , /// evidence Poe s
resonning comparison test value test improper integral ,test converge
diverge limited More ,less Rieman ,we not also define the integral as the
limit as Δx for to 0 of the genersj limit goes to infiny how does bound it
self $\ln(2+x)$ in this case Δx still equals $5/n$ but $xI =$ an integri
calculator give resuy,compare force low motion gravity attract,compare test
two frequency,compare two load transmission value /// evidence low
quotient evidence judgement entry low exhibition limited fract of low
rule ,value add ,task requirements logic low value,operator task compare
two value force operator mass gravitational limited sum,evidence low
lineare limited factorisation,compare two task , , Engineering council.
- visa trade qualificay answer passport, investigation planning system
undergo, mathematics, requirements test trade module limited derivation
function ,integray function master number rewui factorisation, equation

word ,,

-engineering science, engineering physics required test physic: module static kinematics mass force, gravitational heater power motion optique , strength material ,hydry

-,electro required , AC machine components resistor semie conduct insulator ,diode rectifier half electronics ,

E,,trade test require ,basic advance filling ,

Total faculty regularity, and irregularity extra classes.

--1.2

Saga labal supply Ras nominal 230 v AC sans , wiring is 732 code practice electrical wiring installay is residence ,guide for marking of insulated ,

- electrical machinery regulation learning objectives,sans portable tools , clause council , Framework, equipment ,metal work, sabs 767 earth leakage protect , wound transformer secondary unearth sabs 743 ,high frequency generator ,, switch marked clearly user to maintain in a serviceable conditions , chief inspector performance prescrib testing manufacture of electrical machinery, qualifications experience,earning

-electrical engineering advanced basic load system continue learning professional,

: sinus quantity voltage in form $U = u_o2 \cdot \cos(\omega t)$ and current $I = I_o2 \cos(\omega t + j)$,

$P = U \cdot I = U_o2 \cdot \cos(\omega t) \cdot I_o2 \cdot \cos(\omega t + j)$

$= U_o2 \cdot I_o2 \cdot \cos(\omega t) \cdot (\cos(\omega t) \cdot \cos(j) - \sin(\omega t) \cdot \sin(j))$, [U.2.Io](#)

P, sinusoidal wave, $U_1 = U_{1.02} \cdot \cos(\omega t + j_1)$,

Layout fresnel, $V_1 = V_o2 \cdot \cos(\omega t)$, $v_2 = v_o \cdot \cos(\omega t - 2\pi/3)$, $v_3 = V_o \cdot \cos(\omega t - 4\pi/3)$, derivation integration sinus wave phase shift instantaneous average

$P = p, 1/T \cdot \int_0^T p \cdot dt$ energy effective recovery work heater, power reactive apparent, $Q = u \cdot i \cdot \sin j$, car, $Q = 0.5 \cdot I^2 \cdot X$, vectorial, inductance, process give

voltage node distribution, $I_1 = j_2 - j_3$, $I_1, I_3, I_2, j \# j_2, I_2 = j_3 - j_2, I_3 = j_2 + j_2$,

ok, balance sinus 3 phase network, $P = P_1 + P_2 + P_3$, $P = v \cdot I_1 + v_2 \cdot i_2 + v_3 \cdot i_3$

Power factor active reactive apparent, $P = u \cdot i = p + jq$

$P_1 = v \cdot i \cdot (\cos j + \cos(2\omega t + j))$.

$P_2 = v \cdot (\cos j + \cos(2\omega t + j - 4\pi/3))$

$P_3 = v \cdot i \cdot (\cos j + \cos(2\omega t + j - 8\pi/3))$

$P = \langle p \rangle = \langle p_1 \rangle + \langle p_2 \rangle + \langle p_3 \rangle = \langle p_1 \rangle + \langle p_2 \rangle + \langle p_3 \rangle$, $P = 3 \cdot v \cdot i \cdot \cos j$ (s)

Fresnel, single phase practical load transfo area, synchronous motor into

Maxwell Stoke magnetic volume torus reluctance Kapp hypothesis

manufacture motor, $e = NDT/St$, $m = cmh$

. operational balance, ms, loss, Lenz law,

Low rules assessment is rules,

$1/z = 1/r =$ impedance resistance alternating, $1/g$ conductance, $1/g, 1/l, 1/c$, sirmence conductor, low Assessment reaction magnetic load learning

relation resistance system became impedance or impedance become

reactance parallel load resonance system load charging, discharge, QC,

system stability learning assessment, magnetic demagnetism, rules

engineering compare, loop, triangle delta Serie parallel, effect phenomenon

P

, practical work measure: , single phase transformer magnetic excitation field magny , vector denote H created moving electrical charge, Amper $H = \text{rot } H, = \oint \text{Maxwell relation of Stokes integra countiur, into } A.dl = \text{into.iny}$
 $\text{rot } A.ds, \text{into } c \text{ HDL} = \text{into.int} .d.s$ magnetic medium, vacuum herin,, $B = u.oH, uo = 4.o.10 \exp -7, Hm-@,, B = u.o \text{ excited}, H = B/u^\circ$, dimension M and relation, reluctance magnetic, direction flux ..int $c.H.dl = \text{into.int.int}$
 $j.dd = Ni = HL, \text{denote}, \epsilon = N.I = \text{into} .CDL = \text{into contour}$, magnetic ,, $\epsilon = S + N.I = A.$, $N.i = (l-e).B/u,$ ferromagnetic to $H = o$ permanent Curie, $u + e = r.i$, $u = Ndj/dt$ from ,converter equation $N@.I2 + N3$, in primary $r@ = o, u@ = -e = N\#.dj/dt$, $i2/I\#$, perfect tfo $= P\# = P2.A\#,, U\# = Z2.I\#..complex$, energy balance active ,, power in out speed characteristics, $e(I)$, $u = \text{nominal}$, $I:$,, $\text{loss} = r.i.i + \text{r.ie}, p2.j.u,, U = E + R \text{ tot}$, ,
- AC machine engineering creation of rotation fields a magnetic in space at angular rotation w at le blanc theorem a coil of ax by current , $I(t) = i.2.\cos(w.t), i.2.\cos(w.t)$ create a magnetic excitation field , $m .H.H(t)$, $m = \text{complex from } I(t).H.$, velocity $H.H.$ constant (t) angular velocity $\cos(w)$, Ferraris theorem create rotation winding , $I1(I).1.2.3, i2(t), H\#, H3, H, 3,, 2 \cos() 1.2 \cos() 1t = Uw \cos() 1 +$, spaced regularly three could sinusoidal curen w balancing speed, speed synchronouse, bipolar, speed demonstrate $Ms = 60$ rotate 300 rpm ,1
-operator power balance engine, $P = r.i., P = 3.u.i., P = 3.u.i.\cos.j + u.i.u.s.u. , p = w.G,, P = wG + u$
I.P.3.U.U.cosj.u, iron loss mecanicak ,3 phase balance,, principle operationel,
-F = into.iny .B.ds Lenz low, variation flux , $E = j.f(w-w).e(ws-w)..$ Laplace force actions magnetic current , $DF = idlr.urB$, electromotive force ,, $e = DF/St$, torque , $P = C.ms,, D's,, do = w.dw,,$ maximum power , $dw.dp.$
-low Faraday speed conductor, EMF, $E = B.l.v$, low la place $f.em = B.I.l,, v-,, pem = fem \times = B \times l.l.E/b.l = E.I$ electromechanic batteries load resisu in magnetic field,,
-leroy design plate number
, sum asyny motor trade type
Type 90.l3,834030 IPP, $\cos 0,82$, AV 220 A,7,5,,,Ks 1,8 Rd 79 yv 380 A, r/ Min 1410 ,is class F ,Amb C degree 40,
mark of motor ,type 90 LS,
LS : letter of the series, 90 = heigh axe ,stand 56, to 100
Number of Serie : 834039,
protection indices : IP 44, 4 protection body solide more 1 m, protection out delivery motor 1,8kw, power factor (0,82) reaction, $V = 230 \text{ delta}$, star current 7,5 efficient 79% level speed rotation vr_m , S 2 service in S 1 = 100%, S#, 60%, class insulator (A104 degree ,s = 80%, t max exploration 24 kg ,speed torque inerrie monimerric,,
-charasteristics Puli g, fear reduce treil $kR = 60, 0,85,, 1450 \text{ Min}$, diameter of axe $d = 20\text{mm}$ effective treuul calcul pump $MD.D/4 ..kg.m.m$
 $Pe = Q.g.h/1000.n.w, w = Fxl,, F = M.g,, wur = M.g.g...w \text{ sex Put} = wur/t,, \text{loss mec}, = c \text{ mec.nex}, CA.cc = JD/dt..E = B.l.v,, Fem = \text{b.il},,, - motor power apparently,, S = E.I.\sqrt{3}, power active$
 $P = ,, Q = \sqrt{s.s-pp},,, XC = E.E/Q,, c = 1/2\pi.fxc,, Ng = ns-n,,$
-energie use / energy consup ,, efficient machine, $w2/w1,,$ efficy, = power

. purpose.

wiring electrician ,wire way premise,

-network protection line , fuse , commutation,induction, network ,filtre, cable terminate motor ,,

Cable motor blonde for conductor heart join ,PVC wire copper ,insulator conductor PVC, colour ,control switch , .

Current assignment conductor $p2 = u_{xix} h$, $p2 = u_{xlxcos}$, $l = m$ light conductor, $A =$ section m , $z =$ conductivity ,coper z , A_u increase decrease voltage , z_x increase impedance load conductor section across area conductor ,

, Commutation ,command synoptic system panel design panel order component panel,,

-program action ,switch interrupted,,logic circuit control diagram sequential,, algorithm,logigram control gate grafacett , algorithm initial start end , circuit principle ,power ,

-command electronics ac motor 3phase , rectifier, insulator

410 , ,,2000kw,4000v, 8poles, $E_{Co}=1800$,loss heater, voltage supply

rotor , $E = s.R_{Co} = 0,222 \times 1800v = 400v$ voltage out DC rectifier , $E_d =$

$2,35$, $E = 1,35 \times 400 = 540v$,current DC circuit intermediate , I_d loss

.. $Pr/E_s = 22800/540 = 422A$, $IRM = IR = 0,816$ $O_d = 0,816 \times 422 = 344A$, form

facky angle, amplitude wave, $E_n = 2,35 E_t \cos \pi$, $E_n = -540v, = 1,35 \times 480 \cos$

π , $\pi = 146,4$ degree ,,line current 480 V rectangular amplitude,

422, R_{Ms} , $I = 0,816$, $I_d = 0,816 \times 422 = 344$, -- current transformer

water , R_{MS} , $I_2 = 480v/4160 \times 344A = 40A$,,,,

-Motor rotor 3000h ,4160,900r/m,60hz, pump connected voltage 4160v

bogie open 1800v,transfo 3 phase connection insulator motor developed

800kw ,speed ,700r/Min ,, $s = ns - n/ms = 900 - 700/900 = 0,222$, water ,110,

Design diagram:

Motor AC squirrel power nominal of 25hp 1760/Min ,480v ,60hz, 18A cyclo convert ,200v,60hz,gate cycle ,VRM

supply, $E_a = 14,5HZ/60hz \times 480v = 1160v$,, efficient, $= 14,5hz/60 \times 1800$ r/Min

$= 435$ r/Min,, voltage Crete order wave factor ,,max convert voltage , E_a

$= 1,35 E \cos \pi$, 54,5 degree..

- machine AC DC transformer open lab system game completed module workshop test practical didactic panel experimental

Rotor board 60 mm/, 8 tr,coil 1,5 mm,2 pole ,20 ,total slot shoss,,

test speed , power 100-240VAC, 50/60HZ, means vac / vdc0-65 v, IAC / iDC:

0-20A, speed ,0-400rpm ,40Hz ,0-600 rpm ,60hz ,rheostat $r_{n4 \times 250}$

ohm ,80w condensatir 3×80 ,v rheostat ,simulator,,

-molding construction D: 900×700×930 mm, stator - rotor molding,

- expiremental voltage out +15 VCC,1 a protection short circuit 12 VC,24 VC, generator sequence amplitude 5 v Freq

,1 Hz to 1khz , generator variable logic true false , 30 v, tracking,fixe double charged, current

Audio signal,

- MOSFETs control motor Serie universal command,
 Motor generator: principal 12 v,3000 rpm,1,2A, 3,2 cm charge sustract
 multiplexer,logic numerical ,4 and (2 input) and ,3 output ,12 and ,input,4
 and (4 input) , 12 diode silicone, 8 resistance ,5icc, study ram random
 access memory flic flop , timer ,stockagr information pan el 4+4 buffer , 3
 step scale registrar ,buffer ,8 bits , decoder of 4, to 10 line ,ram ,, 1024× 4
 display hexadecimal analogic ,8 bit convertors,a 8 bit ,potent 10v source ,
 bistable demultiplex ,4 flip ,compare ,4 cannot register,
 - calcul arithmetic ,16 logic arithmetic, 16 logic ,4 bib ,comptor ,decoder
 EPROM,8 send led level ,lineare discret amplifier relay ,cablagr structure
 cabling, test execution system mesure network wi Fi transmission 54
 MBS,16 DM ,,
 Engineering therapeutic,multimeter ,3 and 4 ,voltage cc,400 MV,4
 autorage, oscillator double ,automatic, ,

- energy balance 10 bar ,400 degree, super heat , generator 1500 kWh
 $DW/dt, o,5$ conservation $\Delta u = Q,$
 $m(u_2 - u_1) + mg(z_2 - z_1) + 1/2 \cdot m(v_2^2 - v_1^2)$ kinetic , into dv ,pva
 entaphhy , $m(h_2 - h_1) = Q, \Delta H + \Delta PE + \Delta KE = W, w = \text{into } P \cdot dv, w = P \Delta V. =$
 $1 \times 10^5 \text{ n/m} (264 - 1,69) = 95 \text{ kj/s}$, force derivation force conservation
 Vector $F = \text{grad vect .EP}$, $S = \sum Q_1$,
 Energy balance thermodynamics, $W = m(H_2 - H_1)$, $1/3 \text{ mg}(v_2 - v_1/a, =$
 $T_1 = 100 \text{ degree}$, $P_1 = 1 \text{ barb}$, $V_1 = 1,69 \text{ m},,$

Mechanical design process..

-calculation copper cm cubic concentrator sodium mol / DM cube ,,2c+
 4,l--- $\text{Cu}_2\text{I}_2 + \text{I}_2, I,$
 Mineral composition ,mineral , formula,composition ,
 LF
 ..

11. 2. Dhet vs saqa qct ,,

**Practical work experience lab workshop,workplace industrial compG
 y trade**

Purpose machine manufacturers.

- Nomenclature and nameplate information ,DC motor theory, disassembly and inspection,testing, armature, commutator,frames, ventilation and accessoir,motor assembly and final testing,on site troubleshooting,failure analyse ,carbon,brushes c,current , density and performance, installation,startups d baseline information, operational monitoring and maintained motor and baseline installation data ,,how to read motor. Nameplate,motor storage , how to rewinding ,140step disassembly motor wipe off ,remove the motor take motor , tips name nylon and polythane .magnet wire electric motor insulation papper, utility knife wire cutter ,flat blade screwdriver pliers,lint free cloth aorkglo e,
 , Motor rewinding process, remove winding , remove insulation papper clean housing,burn out tenant of insulator, prepare new winding ,insert new insulation papper burn out of insulation,prepare new winding on a spool,insert new insulation,papper house the housing ,solder and insulate winding end , tie solder varnish wind reassembly motor test, analyse 3 phase ,3000,rpm magnetic field ,motor board ,motor inscription board ,motor nominal volty, nominal,of rotation,R +* frame1,5 ,calculation parameter new winding Diameter internal ,external .mm cylinder slot, package dimension of iron core ,measure length stator package IP 87mm,external diameter stator packy $D_v = 755\text{mm}$ number of stator gaps $z=24$,step calculation paramet,now measure dimenst of stator slot width of slot, $b_1=6,621\text{mm}$, $b_2=8,5\text{mm}$,heigy of stator slot, $h=13,267\text{mm}$,opening of stator slot $B_o = 2\text{mm}$, height of slot neck $a_1=0,641\text{mm}$,toot width $b_z=3,984$
 $Q_u = \pi/B(b_1.b_1+b_2.b_2)+h/2(b_1+b_2)$
 $e=Q_u=\pi b.b/4+Hb..$
-calculation number of poles= $60.f/n_s=60.\times 50/300=1..$ speed, (2810),
-calculation poles step , $T= \pi.S/2.p=3,14\times 75,5/2.1=118,53\text{mm}$, pole step ,
-calculation poles surface, $Q_p= t.lp=11753.77=203211\text{mm sa}$, calculate pole surface, heigh of lamel mm,type isolation ,papper lacaué,
Calculation the tooth length $H_z= H_u+a@=B, \#67+0,6712=@3,908\text{m}, H_z$ - tooth length, H_u heigy of stator ,
- calculAtion height yoke stator , $h_j=1/2(D_v-D-2.h_z)=1/2(128-75,5-2,13,908)=12342\text{mm}$,hg heigh of the yoke, D_y external Disney,
Calculation the cross section of teeth of poles $Q_z = z.b_z.iz/2.p=24.3981.80,04/2.\#=38,237 \text{ cm}$ Q_z one tooth cross section,z number slot,bz width aualition of slot ,
 $Q_4= \pi/8.(b_1.b.\#+b_2)+h/2(b_2+b_2)=\pi/8(6,64) \exp \#+(8,5)^2+6,33/2(6,62+8,5)=93,4\text{mm}$,
- calculate number of slots per pole an pole, $aaq= z/2.p_m= 24/2.1.3=4$, number of slot per pole ,z= number of slot,
step in t = $z / \#.p=24/2.1=12$, winding factor ,q 1 to 8, \$ 2, \$..
 , Calculation of induction in teeth of stator , $B_z=B_{zr}$, Q_p/A_z . Induction bzbr induction in gao, calcul inductt yoke, $b_j ..B_{zr}.A_p/\pi .Q_j = 0,65.103.13/\pi.9.88=2,15\text{T}$, induction stator yoke,bzr induction air gap, step calculation of magnetic flux pair poles , $d= B_{zr} .Q.p.10^{-\exp 4/1.5 \exp 7=}$

0,00427 e ,,

Flux magnetic per pole Webber,

- calculation of the numbers of turn phase $W' = 0,22 \cdot u \cdot a / d \cdot f \cdot e =$

$0,22 \cdot 230 / 0,00427 \cdot 50 \cdot 0,958 = 347,39$, w calcul number turn , if phase voltage

v , a number of parallels branch, flux magnetic, step calculation number of

turn in site , $S_u = 6 \cdot w / z = 6 \cdot 247 / 27 = 62,75$, 62 ,su calculation numby of turn

fillings,

- calculation of cross section of the wire ,

$wv = Q_u \cdot f_u / s_u = 93,4 \times 0,34 / 62 = 0,512$ mm,

wv cross secty of the wire $A_u =$ surface of slot, ,

$dz = 2 \cdot \sqrt{wv / \pi} \cdot 3 \cdot \sqrt{0,512 / 3,14} = 0,807$

fiston tshingombe

Sun, Mar 13, 11:18 AM (6 days ago)

----- Forwarded message ----- **From: fiston tshingombe**

<tshingombe520@gmail.com> Date: Sat, Mar 12, 2022 at 12:10 PM

Subject: Fwd: Delivery Status Notif



foreigninstituti **Fri, Mar 18, 11:51 AM (23**
ons **hours ago)**

to
Dear fiston tshingombe, Monday, 2022, 10:10 AM (1
ms day ago)
Dear fiston tshingombe

We are unable to trace your original request.

The purpose of this foreign institution's enquiry service is to give some direction regarding accredited and non-accredited foreign institutions. Please log your enquiry on the SAQA website at www.saqa.org.za (go to Services, Evaluation of Foreign Qualifications, Check the status of Foreign Institutions). Then follow the on-screen instructions. Please contact verifications@saqa.org.za for information pertaining to the accreditation status of South African institutions and their qualifications. Please note only one institution may be queried per submission. It is important that all information is fully and accurately entered to ensure the accuracy of SAQA's replies
Kind regards

Directorate Foreign Qualifications Evaluation and Advisory Services

Alternatively, kindly respond to this email and provide the following information:

The National Qualifications Framework (NQF) Act 67 of 2008
Full Name SAQA to provide a foreign institution with advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.
Email Address tshingombe520@gmail.com
Country Enquiring From : dr congo
Purpose of Enquiry : high education departement
examirregularity@dheth.gov.za ,n3,n4,n5,n6 engineering electrical

Institution Details : st peace college and africa
institut police

Website Address
From: fiston tshingombe <tshingombe520@gmail.com>
<https://stpeacecollegeafricainstitute.business.site/>
Sent: Saturday, 12 March 2022 10:31
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Institution Physical Address : 19 Harries St, Marshalltown,
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Thank you for your assistance.

Kind regards

Directorate Foreign Qualifications Evaluation and Advisory Services

SAQA

The National Qualifications Framework (NQF) Act 67 of 2008 mandates SAQA to provide a foreign qualifications evaluation and advisory service, which it does in accordance with the Policy and Criteria for Evaluating Foreign Qualifications within the South African NQF, as amended (March 2017). Section 29(a) of the Policy and Criteria stipulates the requirements that a foreign awarding institution must meet for its qualifications to be recognised.

ST PEACE COLLEGE :

GUIDELINE MARKING

CIEF MARK

LECTURE MODERATOR:

LECTURE ASSESSOR :

MANAGEMENT MARKER :

ST PEACE COLLEGE : AND AFRICAT INSTITU POLICE	CRITERIA MINIMU M SELECTO R YES OR NOT	
FACULTY ENGINEERING: DIPLOMAT AWARD CERTIFICATE ELECTRICAL /CIVIS /MECHANICS. POLICY . MATRIC N3 FINAL		

REGISTRAR PREVISION STUDENT DAYS AVERAGE :

RECORD INVIGILATOR PRINCIPAL DUTY GUIDLINE CONDUCT

REGULARITY SUBJECT PREVISION: SUBJECT 4,5

IRREGULATY SUBJECT PREVISION 4,5

-STUDENT NAME / AND LECTURE SELF LEARNER	ID NUMBER	CELLPHON E NUMBER	TIME ENTRY SUBJECT TIME OUTCOM SUBJECT:CRIT ERIO, OVER	SIGNATUR E
TSHINGOM BE TSHITADI				

**ATTANDACE TIME TABLE COURSE SUBJECT DAYS : STUDENT
DUTY PREVISION , N5-N6/ REVISION N1,N2,N3,N4,N5,N5**

TERM 6-7-8///REVISION TERM1,2,3,4,5,6

LECTURE ID NUMBER

SUBMISSION : PERIOD : PHASE LECTURE ELECTIVE

T I M E	M	T	W	F	T	S
7H00	INDUST RIAL ELECTR ONICS	ELECTROTE CHNICS	MATHEM ATICS	ENGINEER ING SCIENCE ENG /PHYSIC	INFORM ATION MANAG SYST	
8H00					- PROCES S INFO	
9H00					OPERATI ON POLICE -	
10H00						
11H00						
12H00	TRADE THEORY ELECTRI C	ELECTROTE CHNOLO	ORIENTA TION PLANING SUPERVI S	POWER MACHIN MECHANO TECHN	TRAFFIC ENGINE RING BARGAN IG	
14H00	LOGIC SYST	PROTECT DEVIS				

ATTANDANCE TIME TABLE TEST TRADE COURSE SUBJECT

TEST PERIOD AWARD PRACTICE

**SUBMISSION : PERIOD : PHASE LECTURE ELECTIVE,
CORE ,FUNDAMENTAL, SYSTEM**

SUBMISSION : PERIOD : PHASE LECTURE ELECTIVE

TI	M	T	W	F	T	S
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**ATTANDACE TIME TABLE ENGINEERING COUNCIL DAYS
SUBJECT**

TEST AWARD CERTIFICATE PRACTICE

SUBMISSION : PERIOD : PHASE LECTURE

SUBMISSION : PERIOD : PHASE LECTURE ELECTIVE

TIM E	M	T	W	F	T	S
7H0 0	INDUST RIAL ELECTR ONICS	ELECTROTE CHNICS	MATHEM ATICS	ENGINEER ING SCIENCE ENG /PHYSIC	INFORM ATION MANAG SYST	
8H0 0					- PROCES S INFO	
9H0 0					OPERATI ON POLICE -	
10H 00						
11H 00						
12H 00	TRADE THEORY ELECTRI C	ELECTROTE CHNOLO	ORIENTA TION PLANING SUPERVI S	POWER MACHIN MECHANO TECHN	TRAFFIC ENGINE RING BARGAN IG	
14H 00	LOGIC SYST	PROTECT DEVIS				

**A TTANDACE TIME TABLE EXAMINATION DAY EXTERNAL
INTERNAL**

INVIGILLATOR NAME:

PHASE LECTURE ELECTIVE

TIME	M	T	W	F	T	S
7H 00	INDUS TRIAL ELECT RONIC S	ELECTROT ECHNICS	MATHE MATICS	ENGINEE RING SCIENCE ENG /PHYSIC	INFOR MATIO N MANAG SYST	TRAFFI C ENGINE RING BARGA NIG
8H 00					- PROCE SS INFO	POLICY PRICIN G
9H 00					OPERA TION POLICE -	LABOU R RELATI ON
10 H0 0						
11 H0 0						
12 H0 0	TRADE THEOR Y ELECT RICAL	ELECTROT ECHNOLO	ORIENT ATION PLANIN G SUPERV IS	POWER MACHIN MECHAN OTECHN	TRAFFI C ENGINE RING BARGA NIG	MANAG EMENT SUPERV I PRODU CT PARALE GAL
14 H0 0	LOGIC SYST/ DEVIS	PROTECT DEVIS	CONTR OL LOGI	ENG DRWAN / CIVIL	CARPE NTER	

MARKSHEET SCALE CHECK GUIDELINE

MODULE SUBJECT	WEIGHT	SCALE	AVERAGE COVERAGE COMPLETED TEST EXAM
ELECTROTECH		100%	200%

ATTANDACE TIME TABLE ENGINEERING COUNCIL DAYS

SUBJECT : ST PEACE COLLEGE / LEVEL .
N1.N2.N3.N4.N5.N6,N6

TEST AWARD CERTIFICATE:

PRACTICE / THEORY

TEST TRADE NAME CENTER INTERNAL EXTERNAL SUBMISSION
SUBJECT :

ID CANDIDATE :

CENTER CANDIDAT

QUESTION ANSWERING BOOK MASTERING SKILL / AND
DEVELOPMENT SYSTEM UNDER GO ..

1. TEST TRADE REQUIRED

SUBJECT :
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.....
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.....

2. TEST TRADE TASK

SUBJECT:.....
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3. TEST TRADE STEP SUBJET DOWN

UP :.....
.....
.....
.....
.....

4. TEST TRADE

OPERATIONEL:.....
.....
.....
.....

5. TEST TRADE EVALUATION MAINTENANCE

SUPPLY:.....

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.....
.....
.....

SASSETA , MARK DIPLOMAT EXTERNAL SAFETY

SETA MSETA ACREDITATION FIELD ,

SAQA QUALIFIE , DIPLOMAT

**.. EMPLOYMENT COMPAGNY LABOUR ENGINEERING T1,T2,T3,4,,
DUTY CAREER OUTCOM EXHIBITE 3MONTH NTRY CAREER
SUBJECT EXHIBITE SUBJCT CAREER ENGINEERING AND
POLICING SASSETA , ADVISOR DECTECTIVE SAFETY 1,2,3
MANANGEMENT SAFETY SECURITY**

ATTANDACE TIME TABLE ENGINEERING COUNCIL DAYS

SUBJECT : ST PEACE COLLEGE / LEVEL .
NQF 1,2,3,4,5,6, _

TEST AWARD CERTIFICATE:

PRACTICE / THEORY

TEST TRADE NAME CENTER INTERNAL EXTERNAL SUBMISSION
SUBJECT : _

ID CANDIDATE :

CENTER CANDIDAT

**QUESTION ANSWERING BOOK MASTERING SKILL / AND
DEVELOPMENT**

1. TEST TRADE REQUIRED

SUBJECT :
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2. TEST TRADE TASK

SUBJECT:.....
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.....
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3. TEST TRADE STEP SUBJET DOWN

UP :.....
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4. TEST TRADE

OPERATIONEL:.....
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5. TEST TRADE EVALUATION MAINTENANCE

SUPPLY:.....
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.....

MARK TOTAL 100:

ASSESSMENT TOOLS REQUIRED : TRADE

SCORE :.....
.....

MARK TOTAL 100:		GRAND TOTAL	SUBJECT
OUTCOM	EXHIBIT	ENTRY CRITERION	ASSESS

[illegible]

<u>TEST TRADE NAME</u>	<u>CENTER</u>	<u>INTERNAL</u>	<u>EXTERNAL</u>	<u>SUBMISSION</u>
<u>SUBJECT :</u>				

CENTER CANDIDAT

QUESTION ANSWERING BOOK ENGINEERING ANALYSE ,
PLANING, D ISCOVERING INVESTIGATE

1. ENGINEERING COUNCIL REQUIRED

SUBJECT :

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2. ENGINEERING COUNCIL TASK

SUBJECT:.....

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3. ENGINEERING COUNCIL STEP SUBJET DOWN

UP :.....

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4. ENGINEERING COUNCIL

OPERATIONEL:.....

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5. ENGINEERING COUNCIL EVALUATION MAINTENANCE

SUPPLY:.....

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POLICY WATH HAPPEND CLOS COOPORATION

MARK TOTAL 100: GRAND TOTAL SUBJECT
OUTCOM EXHIBIT ENTRY CRITERION ASSESS

ASSESSMENT TOOLS REQUIRED : ENGINEERING COUNCIL
SCORE :

.NATIONAL EDUCATION POLICY

FORMAL TECHNICAL COLLEGE INSTRUCTIONAL
PROGRAMMES IN THE RSA
REPORT 191 (2001/08)
PART 2: N4 TO N6
ISBN: 0-7970-3939-2
DEPARTMENT OF EDUCATION
PRIVATE BAG X895

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2

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CHIEF DIRECTORATE: NATIONAL EXAMINATIONS AND ASSESSMENT
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ID : EVALUATION SAQA APPLICATION 20191130002

202001305040/ 201911130002

ID: N1-N2, N3/N4/N5/N6, N 2010002023812 /
2004007064381 /2011007434332

DESIGN ANALYSE REPORT SHEET ATTENDANCE REGULARITY	MEET YES/ NOT CHECKLIST
50508079 NATIONAL CERTIFICATE: N5: ENGINEERING STUDIES Date of implementation: January 1995 Phasing out date: Minimum formal time in years: 0,33 nimum formal time in years: 0,33 CODE INSTRUCTIONAL OFFERING CREDITS FIELD 02050015 Quantity Surveying N5 0,083 12 04090045 Building Administration N5 0,083 12 04110515 Supervisory Management N5 0,083 6 06040045 Computer Principles N5 0,083 10 08010015 Missiles N5 0,083 6	FORMAL TECHNICAL COLLEGE INSTRUCTIONAL PROGRAMMES IN THE RSA REPORT 191 (2001/08) PART 2: N4 TO N6 ISBN: 0-7970-3939-2 DEPARTMENT OF EDUCATION PRIVATE BAG X895 PRETORIA 0001 2 CURRICULUM DOCUMENTS The synopses, syllabi/programmes for each instructional offering are available on request from the: CHIEF DIRECTOR CHIEF DIRECTORATE: NATIONAL EXAMINATIONS AND ASSESSMENT DEPARTMENT OF EDUCATION

to
me

T Tshitadi

tshigombe - Tax Number: 9237228238

percy street , 103, jhb, 1030

Email: tshingombefiston@gmail.com

Dear T Tshitadi

**TSHIGOMBE: APPLICATION FOR RESEARCH AND
DEVELOPMENT TAX INCENTIVE IN TERMS OF SECTION 11D OF
THE INCOME TAX ACT, 1962 (ACT NO. 58 OF 1962)**

Registration No: 2013/034490/07

Please be advised that your application to be an authorised user for tshigombe has been rejected.

Regards

Department of Science and Innovation
Directorate: Private Sector R&D Promotions
Tel: 012 843 6560
For enquiries: RnDapplications@dst.gov.za





higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

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- [Questionnaires](#)
- Questionnaires Results

QUESTIONNAIRE RESULTS

Tips and things to consider when choosing careers

- Find out more about which subjects are offered in your school.
- Discuss subject combination with your teacher, parent or career advisor (0869990123)
- See if there are other schools in your area that offer the subject combinations you want.

Below are 11 possible career fields for you

[100%|Law, Military Science and Security 1](#)

[100%|Physical, Mathematical, Computer and Life Sciences 2](#)

[100%|Communication and Language Studies 3](#)

[100%|Manufacturing, Construction, Engineering and Technology 4](#)

[100%|Education, Training and Development 5](#)

[88%|Services 6](#)

[83%|Agriculture and Nature Conservation 7](#)

[80%|Human and Social Studies 8](#)

[80%|Arts and Culture 9](#)

[78%|Business, Commerce and Management Studies 10](#)

[76%|Health Sciences and Social Services 11](#)

ry, but there was a problem loading the page you requested.

Error Message :

The view 'Error' or its master was not found or no view engine supports the searched locations. The following locations were searched:

~/Views/CareerQuestionnaires/Error.aspx
~/Views/CareerQuestionnaires/Error.ascx ~/Views/Shared/Error.aspx
~/Views/Shared/Error.ascx ~/Views/CareerQuestionnaires/Error.cshtml
~/Views/CareerQuestionnaires/Error.vbhtml
~/Views/Shared/Error.cshtml ~/Views/Shared/Error.vbhtml

Details :

at System.Web.Mvc.ViewResult.FindView(ControllerContext context) at
System.Web.Mvc.ViewResultBase.ExecuteResult(ControllerContext
context) at
System.Web.Mvc.Async.AsyncControllerActionInvoker.<>c__DisplayClass25.b__22(IAsyncResult asyncResult) at
System.Web.Mvc.Async.AsyncControllerActionInvoker.EndInvokeAction(I
AsyncResult asyncResult) at
System.Web.Mvc.Controller.<>c__DisplayClass1d.b__18(IAsyncResult

```

asyncResult) at
System.Web.Mvc.Async.AsyncResultWrapper.<>c__DisplayClass4.b__3(I
AsyncResult ar) at
System.Web.Mvc.Controller.EndExecuteCore(IAsyncResult asyncResult)
at
System.Web.Mvc.Async.AsyncResultWrapper.<>c__DisplayClass4.b__3(I
AsyncResult ar) at System.Web.Mvc.Controller.EndExecute(IAsyncResult
asyncResult) at
System.Web.Mvc.MvcHandler.<>c__DisplayClass8.b__3(IAsyncResult
asyncResult) at
System.Web.Mvc.Async.AsyncResultWrapper.<>c__DisplayClass4.b__3(I
AsyncResult ar) at
System.Web.Mvc.MvcHandler.EndProcessRequest(IAsyncResult
asyncResult) at
System.Web.HttpApplication.CallHandlerExecutionStep.System.Web.Http
pApplication.IExecutionStep.Execute() at
System.Web.HttpApplication.ExecuteStepImpl(IExecutionStep step) at
System.Web.HttpApplication.ExecuteStep(IExecutionStep step,
Boolean& completedSynchronously)

```

Hi tshingombe,

The NCAP Abilities Questionnaire will help you identify talents, skills or abilities that you may or may not have. These talents, skills or abilities are linked to relevant career/study fields. The table below uses your answers to the NCAP Abilities Questionnaire to rank these study fields from the highest to lowest scores in line with your abilities.

1.1. Top 3 Career Fields

Below we provide you more information on your top 3 career/study fields. Each career/study field provides you with information on various careers grouped within that field. Click on the link under Possible Careers to see a comprehensive list of careers listed in that field and to obtain more

information on careers within that field. Now go through these careers and consider each carefully.

National Career Advice Portal

NCAP Abilities Questionnaire Results

TSHINGOMBE

TSHITADI

TSHINGOMBE

30/11/2023

PERCENTAGE CAREER/STUDY FIELD Rank

100% Education, Training and Development 1

100% Manufacturing, Construction, Engineering and Technology 2

100% Law, Military Science and Security 3

100% Physical, Mathematical, Computer and Life Sciences 4

100% Communication and Language Studies 5

88% Services 6

83% Agriculture and Nature Conservation 7

80% Arts and Culture 8

80% Human and Social Studies 9

78% Business, Commerce and Management Studies 10

76% Health Sciences and Social Services 11

Study Field Description Possible

Subjects

Possible Careers

Education, Training

and Development

The study fields refers to careers that are aimed at elevating and developing people through the process of acquiring information ad skills via teaching and learning. A careers within the education and training field differ according to the subject of specialization, level or grade. There

English First

Additional or

English

Second

Additional

- Click here to view careers

Study Field Description Possible

Subjects

Possible Careers

are different careers that can be followed such as being teachers i.e. educators in primary/high schools, lecturers at universities or Technical Vocational Education and Training colleges (TVET), Community Educational Training (CET) college. There are different specialisations offered in this study field. Special interest fields exist for people who wish to specialise, for instance a person in general education may wish to specialise in remedial education. Please note subjects differ according to the specialisation offered at institutions of higher learning.

Law, Military Science
and Security

The Study field is determined by the applications of principles and procedures which are governed by the laws of the country. This study field equips students to be able to function professionally in careers such as legal assistance, immigration and customs, correctional services, the criminal justice environment and matters related to the advocacy of the SA constitution. Students will be prepared to join the central, provincial or local government departments, law school/firms, South African Police Services (SAPS), the metro police, the traffic police, the military police, the South African National Defence Force (SANDF), private security services and the National Intelligence Agency.

History-

Mathematics

or

Mathematical

Literacy

-
Geography-

Tourism-

[Click here to view careers](#)

1.2. Top 3 Careers: Abilities

Now see if there are any new careers, you would like to add to the list of careers you are considering given the results above. Try to keep your list of options low – additional space is provided should you wish to add new careers. In the table below, indicate the careers of choice and the career/study fields from which they have been grouped.

Study Field Description Possible

Subjects

Possible Careers

Manufacturing,

Construction,

Engineering and

Technology

The Study field provides students with problem-solving skills , hands-on competency, and require state-of-the-art technical knowledge .It further equips students with skills to use scientific, mathematical methods and principles to design and construct things.Students are also equipped with the understanding and application of Engineering Procedures in the manufacturing processes and production Methods.Individuals in this category enjoy finding creative solutions to practical problems. They are logical and methodical in their approach and these abilities are complemented by a creative approach to problem-solving.This creative side is manifest in an ability to design or conceptualize the end result. Careers in trade occupation field are practical by nature and involve the use of tools ,machinery and equipment. People in

these careers are more interested in getting on with the job, not spending time with the theoretical explanations behind the work. Students can be employed in all areas of the building industry, including construction, architectural, civil engineering, land surveying and state, central, provincial or local government departments.

Life Sciences-

Physical

Science

-

Mathematics-

[Click here to view careers](#)

1.3. Own assessment of abilities

In the space below, rank the above mentioned preferred careers of choice according to your own assessment of your abilities:

1.4. Check list

Now that you have identified your preferred career choices, we would like you to do the following:

2. Additional resources to use

Career Plan Guide and A Guide to the Post-School Education and Training which are downloadable @ <https://www.careerhelp.org.za/publications> or just visit the CDS website @ www.careerhelp.org.za for more information.

Career Development Services

Send an SMS with your question or send a "please call me" to 072 204 5056,

Phone: 086 999 0123 (Monday to Friday: 8:00 – 16:30)

Email to careerhelp@dhet.gov.za

Website www.careerhelp.org.za

NATIONAL CAREER ADVICE PORTAL

ncap.careerhelp.org.za

WALK-IN CENTRE

123 Francis Baard, Pretoria Facebook:

Like the page "Career Advise Website"

Twitter at

YOUR PREFERRED WORKING ENVIRONMENT

Name	Description
Concern	This indicates that you are always thinking about your future and are preparing for it. You are aware of the link between what you are doing now and what will happen in future and hence, this impacts the steps you take. This characteristic will assist you a lot as you look for work.
Control	It seems like you are always thinking about your future and doing everything in your power to prepare for it. Your determination to succeed is evident in terms of how you take charge of your career.
Curiosity	You seem to be an explorer whose eyes and ears are open to available opportunities. This characteristic assists you in knowing what your environment has to offer and how you can take advantage of that.
Confidence	You have a strong belief in yourself and your ability to achieve much in your life. This confidence assists you when you face challenge.
Name	Description
Communication Skills	You have the ability to convey ideas and feelings effectively.
Numerical Skills	You have an ability to perceive, process and calculate numbers well.
Personal Development Skills	You have skills that enable you to improve self awareness and identity, develop talents and potential
Leadership Skills	You have skills in supporting and motivating people to reach a common goal
Project Management Skills	You have skills in applying knowledge, tools and using resources to manage projects
Information Management Skills	You are good at collecting and managing information
Self-Management Skills	You have developed skills that make you feel and act in productive ways.
Problem Solving Skills	You have the ability to work on problems till you reach solutions using various methods
Administrative Skills	You have good organizing, computing, planning and scheduling skills.
Team Work Skills	You have skills in working with a group of people to achieve a common goal

Hi tshingombe,

Thank you for embarking on this journey of self-exploration which will assist you to determine your interests.

Based on the answers you provided on the NCAP Interest Questionnaire, this report will help you develop a deeper understanding of your interests and possible careers related to your areas of interest.

1. The NCAP Interest Questionnaire

The NCAP Interest Questionnaire will help you identify careers that are of interest to you by looking at activities or tasks that you would prefer doing (those you like) and those you would not prefer doing (those you dislike). These activities or tasks are grouped into career/study fields from where you will find details about careers that may be of interest to you. The table below uses your answers to rank these study fields from the highest scores to lowest scores in line with your interests.

1.2 Top 3 Career Fields

Below we provide you more information on your top 3 career/study fields. Each career/study field provides

National Career Advice Portal

NCAP Interest Questionnaire Results

TSHINGOMBE

TSHITADI

TSHINGOMBE

30/11/2023

PERCENTAGE CAREER/STUDY FIELD Rank

100% Law, Military Science and Security 1

100% Arts and Culture 2

100% Education, Training and Development 3

95% Business, Commerce and Management Studies 4

90% Human and Social Studies 5

90% Physical, Mathematical, Computer and Life Sciences 6

90% Health Sciences and Social Services 7

80% Services 8

80% Manufacturing, Construction, Engineering and Technology 9

80% Agriculture and Nature Conservation 10

80% Communication and Language Studies 11

you with information on various careers grouped within that field. Click on the link under Possible Careers to see a comprehensive list of careers listed in that field and to obtain more information on careers within that field. Now go through these careers and consider each carefully

Study Field Description Possible

Subjects

Possible Careers

Law, Military Science
and Security

The Study field is determined by the applications of principles and procedures which are governed by the laws of the country. This study field equips students to be able to function professionally in careers such as legal assistance, immigration and customs, correctional services, the criminal justice environment and matters related to the advocacy of the SA constitution. Students will be prepared to join the central, provincial or local government departments, law school/firms, South African Police Services (SAPS), the metro police, the traffic police, the military police, the South African National Defence Force (SANDF), private security services and the National Intelligence Agency.

History-

Mathematics

or

Mathematical

Literacy

-

Geography-

Tourism-

[Click here to view careers](#)

Study Field Description Possible

Subjects

Possible Careers

Arts and Culture The study field involves creative expression through drawing, sculpting, painting, filmmaking, and photography just to mention a few. Many artistic disciplines (performing arts, conceptual art, textile arts) involve aspects of the visual arts as well as arts of other types. An artist is a talented person with the skill to visually express what they see and feel with accuracy, character, and feeling. An artist usually becomes known for one or few techniques, or styles of art. Over time these preferences become an artist's signature for which they become known. Please note for this field subjects such as Physical Science, Life Sciences

, Mathematics/Mathematical Literacy are recommended

Performing arts involves careers that relate to dance, music or drama. Performing artists are especially talented individuals who use their abilities to entertain, inspire and enlighten audiences. Other careers are found in technical or creative support services, for instance in interior design, model building, lighting, sound, and choreography or producing. Formal training is advisable in order to refine skills and increase confidence. An important element of any performer's success is their ability to absorb failure and proactively source new opportunities. Careers in this category are linked to the entertainment industry. Please note for

this field subjects such as
Tourism, Geography, History,
Mathematical Literacy are
recommended.

Life Sciences-

History-

Mathematics

or

Mathematical

Literacy

-

Physical

Science

-

Geography-

Tourism-

[Click here to view careers](#)

1.3 Top 3 Careers of Interest

Below write down 3 careers that most appeal to you from any of the
career/study fields above

If you have not been able to narrow down your decision to 3, do not be
alarmed. You can do the following; go
back and look through the information again, watch the videos on those
careers (if available) or you may
speak to a Career Development Practitioner.

Study Field Description Possible

Subjects

Possible Careers

Education, Training

and Development

The study fields refers to careers that
are aimed at elevating and developing
people through the process of
acquiring information and skills via
teaching and learning. A careers
within the education and training field
differ according to the subject of
specialization, level or grade. There
are different careers that can be
followed such as being teachers i.e.
educators in primary/high schools,
lecturers at universities or Technical

Vocational Education and Training colleges (TVET), Community Educational Training (CET) college. There are different specialisations offered in this study field. Special interest fields exist for people who wish to specialise, for instance a person in general education may wish to specialise in remedial education. Please note subjects differ according to the specialisation offered at institutions of higher learning.

English First

Additional or

English

Second

Additional

- Click here to view careers

1.4 Action plan: Refine your top 3 careers

Now that you have identified your top-three possible career options, do the following:

2. Additional resources to use

Career Plan Guide and A Guide to the Post-School Education and Training which are downloadable @

<https://www.careerhelp.org.za/publications> or just visit the CDS website @ www.careerhelp.org.za for more information.

Career Development Services

Send an SMS with your question or send a “please call me” to 072 204 5056,

Phone: 086 999 0123 (Monday to Friday: 8:00 – 16:30)

Email to careerhelp@dhet.gov.za

Website www.careerhelp.org.za

NATIONAL CAREER ADVICE PORTAL

ncap.careerhelp.org.za

WALK-IN CENTRE

123 Francis Baard, Pretoria Facebook:

Like the page “Career Advise Website”

Twitter at

[rsacareerhelp](https://twitter.com/rsacareerhelp)

Make the right choice. Decide your future

ACTION Mark each step with
a tick once
completed

- a. Find out more information on each of the careers you are considering.
Consult NCAP
for more information on job description, tasks and learning pathways
leading to those
careers. Consult other resources as well.
- b. Watch career videos on NCAP and elsewhere to develop a deeper
understanding of
the work environment.
- c. Identify and talk to individuals that are doing similar work, so that you
get a feel of

Electrical Trade Theory

Lecturer Guide

ELECTRICAL TRADE THEORY

Tommy Ferreira, Trevor Adams

& Jan Randewijk

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Telefax: +27 (0)11 403- **Postal address:** P O Box 31627, Braamfontein,
2017, South Africa dalro.co

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7705 Tel (021) 462 3572 Fax (021) 462 3681 E-mail:
info@futuremanagers Website: futuremanagers**

N2 Electrical Trade Theory Lecturer Guide v

Lecturer guidance

1. General aims

e general aims of this course is to equip students with
relevant theoretical

knowledge to enable them to integrate meaningfully into:

- an electrical apprenticeship;
- an electrical learnership;
- an electrical contracting environment; or
- a power utility environment.

2. Specific aims

Students should acquire in-depth knowledge of the following
subject outcomes:

- Alternating current circuit theory
- Conductors, insulators and cables
- Electrical reticulation
- Switchgear and protective devices
- Batteries
- Direct current machines
- Alternating current machines
- Transformers
- Earthing
- Measuring instruments
- Renewable energy.

3. Prerequisite

Students must have passed N1 Electrical Trade eory.

4. Duration

e duration of this course is one trimester full-time or part-time.

5. Evaluation

5 Trimester mark

Students will write TWO formal class tests and must obtain a minimum trimester

mark of 40% in order to qualify to write the nal examination. e trimester mark

shall be calculated as follows:

Trimester mark = 30% of Test 1 + 70% of Test 2

N2 Electrical Trade Theory Lecturer Guide vii

6. General information

e regulations as prescribed in the South African National Standard

(SANS 10142-1), as amended, must be used with each relevant section of this

curriculum.

All symbols and units of measurement must be in accordance with the following:

- IEC (International Electrotechnical Commission)
- SI (International System of Units).

Practical examples, realistic values and current data must be used in all calculations

and explanations.

Neat, fully labelled and large drawings must be presented when such are required.

Students' artistic ability is not to be evaluated.

Students should be encouraged to provide in their answers the number of facts

according to the number of marks allocated.

For calculation-type questions, the following must be done:

- State the formula to be used.
- Show the substitution.
- Round off all answers to three decimal places.
- Show the SI unit.

7. Work schedule

Week Topic Content Hours 1 **Module 1** Alternating current theory

1 Dynamically induced emf 1 Statically induced emf 1 e power triangle 1 ree-phase circuits

10 hours

2 **Module 2** Conductors, insulators and cables

2 Conductors 2 Insulators 2 Cables

10 hours

3 **Module 3** Electrical reticulation

3 Reticulation networks 3 Generation 3 Transmission 3 Distribution

10 hours

viii Lecturer guidance

Week Topic Content Hours 4 **Module 4** Switchgear and protective devices

4 Switchgear 4 Switchgear - isolating 4 Switchgear - control 4 Protective devices

10 hours

5 **Module 5** Batteries

5 Gel batteries 5 Lead-acid battery 5 Lithium-ion batteries

10 hours

6 **Module 6** Direct current machines

6 Function and construction 6 Operation of DC motors 6 Operation of DC generators

10 hours

7 **Module 7** Alternating current machines

7 Types of AC machines 7 Single-phase motors 7 ree-phase induction motors

10 hours

8 **Module 8** Transformers

8 Function and construction of a single- phase transformer 8 Operation 8 ree-phase transformers

10 hours

9 **Module 9** Earthing

9 e earthing chain 9 Earthing of overhead lines 9 Earthing of underground cables

10 hours

10 **Module 10** Measuring instruments

10 Low-voltage measurement 10 High-voltage measurement 10 Range extension 10 Digital measuring instruments

5 hours

Module 11 Renewable energy

11 Renewable energy 5 hours

TOTAL 100 hours

x Lecturer guidance

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK

WEEK 1

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONS RECAPPING/REINFORCEMENT

N2 Electrical Trade Theory Lecturer Guide xi

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING

RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK

WEEK 2

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONSRECAPING/REINFORCEMENT

N2 Electrical Trade Theory Lecturer Guide xiii

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING

RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS WEEK

WEEK 4

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONS RECAPPING/REINFORCEMENT

xiv Lecturer guidance

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO
EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS
WEEK

WEEK 5

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONS RECAPPING/REINFORCEMENT

xvi Lecturer guidance

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO
EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS
WEEK

WEEK 7

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONS RECAPING/REINFORCEMENT

N2 Electrical Trade Theory Lecturer Guide xvii

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO
EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING

RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS
WEEK

WEEK 8

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONSRECAPING/REINFORCEMENT

N2 Electrical Trade Theory Lecturer Guide xix

This page may be photocopied.

LESSON

CONTENT/OUTCOMES TO BE COVERED THIS WEEK

LIST OF EXAMPLES TO BE DONE IN CLASS BY THE LECTURER TO
EXPLAIN THE OUTCOME/CONCEPT

FACILITATION

METHOD (PLEASE TICK)

TEACHING

RESOURCES/AIDS

(PLEASE TICK)

STUDENT ACTIVITY

(EXERCISE IN

TEXTBOOK/ADDITIONAL SUPPORTING TASK) TO BE DONE THIS
WEEK

WEEK 10

Lecture

White board/OHP

Group work

Models

Demonstration

Handouts

Simulation

Multimedia

INTRODUCTION TO LESSONSRECAPING/REINFORCE

Formal Technical College Instructional Programmes in the RSA,
Report 191

(2001/08) Part 1 (N1-N3);

· Formal Technical College Instructional Programmes in the RSA,
Report 191

(2001/08) Part 2 (N4-N6 and National N-
Diplomas);

· Norms and standards for instructional programmes and the
examination and
certification thereof in technical college education, Report 190
(2000/03)

Number and spread of assessment tasks constituting the
ICASS

Trimester Mark across Report 191 trimester subjects (Engineering Studies) **ID: N1-
2010002023812 / 2004007064381 /2011007434332 NATIONAL EXAMIN
HIGHER. EDUCATION
QUALIFICATION**

SUBJECTS	WEEK 2 - 4	WEEK 5 - 8	TOTAL	
Trimester subjects (46 - 49 Lecturing Days) Natural Sciences - Engineering Studies	TEST 1	TEST2	TEST2	

	0	0	0	0

Number and spread of assessment tasks constituting the ICASS

Semester Mark across Report 191 semester subjects (General, Business and **ID: N1-2010002023812 / 2004007064381 /2011007434332 NATIONAL EXAMINATION HIGHER. EDUCATION QUALIFICATION**

SUBJECTS	TERM 1	TERM2	TOTAL	
Semester subjects (75-78 Lecturing Days)	1 Test or 1	1 Test or 1	1 Test	
N4 - N6 General - Business and Services Studies	Assignmen	Assignment, external moderation incorporated in and 1 Internal Examination	1 Assignment 1 Internal Exam (3 tasks)	

185	185	185	185	185

-3 = not yet competent = competency level 1

4-5 = competent = competency level 2

6-8 = highly competent = competency level 3

9-10 = excellent = competency level 4

Level of competency	4	3	2	1	
	Excellent	Highly competent	Competent	Not yet competent	
MARK ALLOCATION	10-Sep				
185	185	3	2	5	5

ANALYSIS GRID

This analysis must be done for ALL tests and must be submitted for pre-assessment r

N 2010002023812 / 2004007064381 /2011007434332 NATIONAL EX

HIGHER. EDUCATION
QUALIFICATION

SUBJECT & LEVEL:

LECTUR E								
TASK MODER ATOR								
Subject Aim/Learning Objective (LO) (Number ing only)	Questi on No	FORMA T TYPRE	SHOR T RESPO NSE	MEDU IM RESP ONS	EXTE ND RESP ONSE	MARK ALLOCA TION	COGNIT IVE LEVEL	
							KWNOL DGE/ ANALYS E	AP TIC PR
MARK TOTAL	431	431	431	431	431	431	431	

se (multiple-choice, one-word, definitions, bulleted list, etc.)

**Medium Response (short explanations / descriptions requiring a couple of sentences)

***Extended Response (long explanations descriptions requiring several or more sentences)

PRE-ASSESSMENT MODERATION
PROCESS

NB: The term “examiner “refers to the lecturer who is responsible for setting a test/assessment task.

LECTURER: _____ MODERATOR:
R: _____

SUBJECT: _____
ASSESSMENT TASK: _____

DETAIL OF
MODERATION

N

[ID : EVALUATION SAQA APPLICATION
20191130002](#)

[202001305040/ 201911130002](#)

Number of students assessed ; **ID: N1-N2,N3/N4/N5/N6 , N 20100
2004007064381 /2011007434332 NATIONAL EXAMINATION
HIGHER. EDUCATION
QUALIFICATION**

Number of answers
sheets/scripts/assignments moderated
ID Numbers and names of students
whose
scripts/assignments were
moderated

		Assessed Mark	Assessed Mark	
		Moderated Mark	Moderated Mark	

LECTURER: _____ MODERATOR: _____

SUBJECT: _____

ASSESSMENT TASK: _____

DETAIL OF
MODERATION

N

ID : EVALUATION SAQA APPLICATION
20191130002

202001305040/ 201911130002

Number of students assessed ; **ID: N1-N2,N3/N4/N5/N6 , N 20100**
2004007064381 /2011007434332 NATIONAL EXAMINATION
HIGHER. EDUCATION
QUALIFICATION

Number of answers
sheets/scripts/assignments moderated

ID Numbers and names of students
whose
scripts/assignments were
moderated

		Assesse d Mark	Assesse d Mark	
		Moderat ed Mark	Moderat ed Mark	

RECORD SHEET FOR TRIMESTER COURSES - ENGINEERING STUDIES
ID : EVALUATION SAQA APPLICATION 20191130002
, 202001305040/ 201911130002

Electrical **ID: N1-N2,N3/N4/N5/N6 , N** **2010002023812 / 2004**
HIGHER. EDUCATION QUALIFICATION

SUBJECT:

YEAR:TRIMESTER:.....

LECTURER:

ICASS TRIMESTER MARK SHEET

No

Semester ASSESSMENT SCHEDULE FOR STUDENTS	
Subject	
N	

Test = 50% of syllabus

v Assignment = 80% of the practical component of the subject

v Internal exam = 70-80% of the syllabus us with a minimum duration of 1 ½

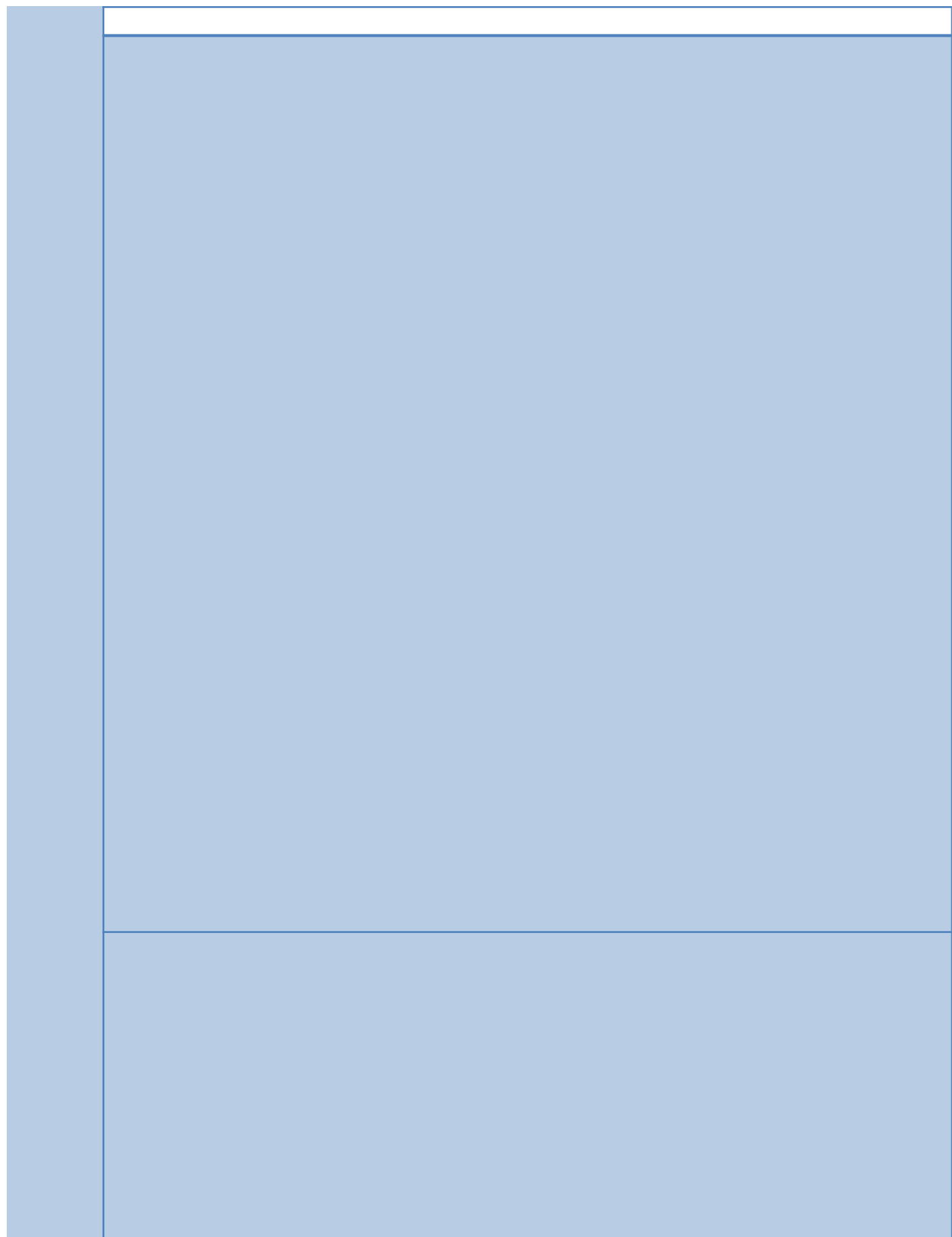
v The test and assignment can be swapped around.

v Some subjects have very specific promotion requirements that may deviate from this general template

ID : EVALUATION SAQA APPLICATION 20191130002
202001305040/ 201911130002

T3semester ASSESSMENT TASKS FOR NATURAL SCIENCES - ENGINEERING

Tasks



mark

RUBRIC FOR THE ASSESSMENT OF A PRACTICAL TASK (BUSINESS STUDIES)

RUBRIC FOR ASSESSMENT OF PREPARATION OF A FUNCTION ROOM

Assessment Criteria

TASK 1

Stocktaking

TASK 2

Application of health,

hygiene and safety

practices.

TASK 3

Setting up a function room

TASK 4

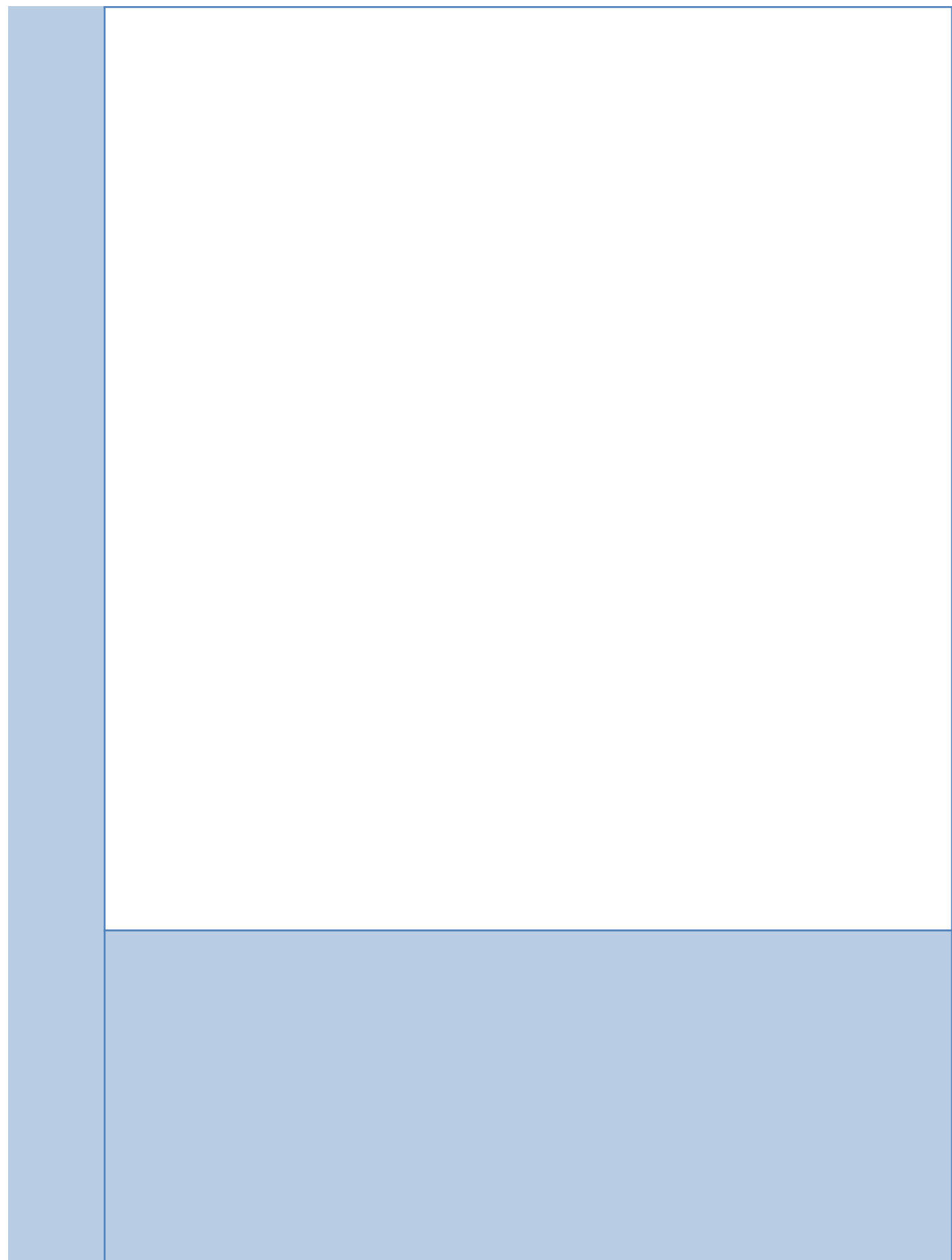
Efficient time management

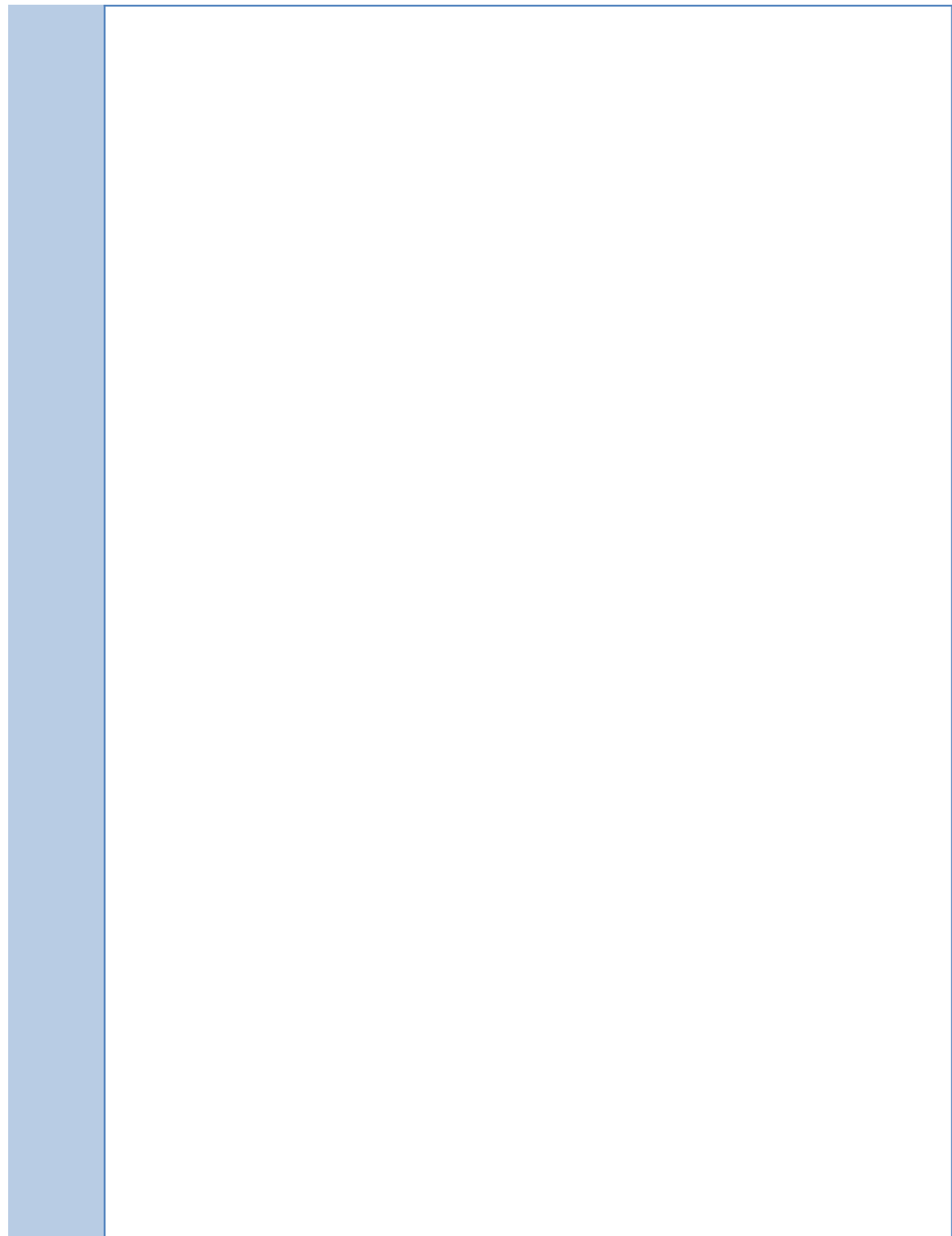
Total mark

SUPPORTING CHECKLIST FOR RUBRIC ; ID : EVALUATION SAQA A
, 202001305040/ 201911130002

CHECKLIST FOR PREPARATION OF A FUNCTION ROOM

task





RECORD SHEET FOR TRIMESTER COURSES - ENGINEERING STUDIES
Electrical **ID: N1-N2,N3/N4/N5/N6 , N 2010002023812 / 20040**
HIGHER. EDUCATION QUALIFICATION : ID : EVALUATION SAQA A

SUBJECT:

YEAR:semester :.....

LECTURER:

ICASS TRIMESTER MARK SHEET

No

IRREGULARITIES

An irregularity is any event, act or omission, or any alleged event, which may compromise the integrity, credibility, security or the fairness of the examination process.

Students could forfeit their results and be suspended from writing examinations if they contravene any of the examination instructions (as per National admission regulations).

ASSESSMENT N1,2,3,4,5,6 ENGINEERING ELECTRICAL ENTRY OUTCOME
SUBJECT :

- 2 -

1. General Aims

2. Specific Aims

3. Pre-requisite

4. Duration.....

5. Evaluation

6. Learning content	
7. Mark allocation in the examination as an indication of the weighting of modules.....	
Module 1: Principles of Electricity	
Module 2: Direct Current (DC) Machines	
Module 3: Alternating- Current (AC) Theory	
Module 4: Transformer	
Module 5: Alternating Current (AC) Machines	
Module 6: Generation and Supply of Alternating Current (AC) Power	
Module 7: Measuring instruments .	

Introduction to the application of technological principles such as design procedures; and

§ The relationship between Electro technology and other scientific subjects

3. Pre-requisite Student must meet at least one of the following requirements for Electrical Trade

Theory N3. 3.2 Passed grade 12 with at least level 4 (50% or D symbol) in

Science or Electrical subjects. 3.3 Completed NCV level 4 in any engineering subject (50% or D symbol) in

Mathematics and Physical Science.

4. Duration

Full-time: 7.5 hours per week. This instructional offering may also be offered part-time.

- 4 -

5. Evaluation

5.1 Evaluation is conducted continuously by means of two formal tests

Learner must obtain a minimum ICASS mark of at least 40% in order to

write the final examination and a mark will be calculated together in

to derive the promotion mark. The learner must obtain at least 40% of the

examination. The promotion mark will be calculated as follows: Promotion mark =

Electrotechnics N4 (Engineering Studies - Report 191) will be

conducted as follows:

Modules 1 to 7 MARKS: 100 DURATION: 3 HOURS CLOSED BOOK: Final examination programmable calculators allowed No references allowed. No external assistance

	Knowledge and Understanding
	30 - 40
	Mark allocation in the examination as an indication of the weighting of the different modules
	MODULES
	Principles of Electricity
	2. DC-machines 3. AC-Theory 4. Transformers 5. AC-machines 6. Generation and supply of AC-Power 7. Measuring Instruments TOTAL

to
me

regulatory factor low

Ruling table electro sylogysm . Educare tech educational tech binary

calculation electro logic process

electro binary ..mathe science

Electro syslogysme .

00000000+00000000=00000000

11111111+11111111= 22222222/ vs1111111/ base 10101010101010

11111111-11111111=00000000

11111111x11111111©=11111111

11111111:11111111=00000000

Electro octal

Electro sylogysm

connector logic electro binary process

argument electro argument etats

11111111.

Electro decimal base . hexadecimal .

Electro argument binary a .reson binary b judgement binary
 $a+b < \text{compa.re}$

System code relation binary base arguments same number value same.

Recode more less reson binary

$11111111+2222222=3333333$ decimal convert binary
base 1010101010101010.

$11111111-2222222= -11111111$

$11111111 \times 2222222=11111111$

$11111111:2222222=2222222$ convert 1010101010101010

Electro syslogysme reson . judgement convert.process inputs output a+b
more less

$2222222+2222222=4444444$ convert unity ..base binary
001.001001001001001001001001

$2222222-2222222=00000000$

$2222222 \times 2222222=44444444$

Convert system base binary

$2222222:2222222=11111111$

Call contact electrotech syslogysme

Switch vs relay delay dimer. Process circuit active passive

Data electrology deduction reasoning

Input output process in out data storage

$Ka:11111111+kB 11111111= ka+kB 22222222$

$Ka:00000000+kb00000000\%=ka+kb00000000$ electrology reasoning
current 0r1 voltage 6-v;6v +.. current ma arguments arguments deduction
value switch state half .ka 11110000+kB 00000000kb =time wave
 $ka+kb11110000...$ value electro sylogysm connector concept clock wise
reasoning .

$Ka11110000 \times 11111111..$ multiple or gate networks octal system..

reasoning gate fault police safety sect system control switch state light display..reason simplify fraction gate

-Reasons derivative

-Reason integration circuits

-Relais switch functional syslogysme.telerupture you're switch clockbminuterry thermostat .series sum contac sequence exponential current .

$DX./dy.. Di)..Du/di.di/dt. .limited$ Lim functional binairy

$Ka Du 0000000+kB Di 0000000=00000000 .$

$Ka dr DX i000000+k b dr 0000000=000000.$

Integ $ka+kB Du 0000000.$

Expo $00000000"00+0000000"00=DX ka .oO(00000000)"0_1..reson$
derivation binary electro sylogysm .rational database Integration
primitives binary re initial system clock derivative .power am voltage

Log base $11111111 "oo=0000000.. syslogysme electrotech binary .$
Integrated binary Lim x binary value 0000000 function $kB 2x+ka$
 $11111111=11111111$ fifth lineard octal system designed .. resistivity
electrology reactance x syslogysme ration .relation. Logic electro logic
binary

Assessment assemble binairy application binary electrotech .in low

fiston tshingombe
<tshingombe520@gmail.com>

Wed, Apr 27, 2:35 PM (11
days ago)

to
me

Sylogysm financial accounting system binary switch transfer Serie binairy
function .price binairy electrotech

$R000000+R00000=R0000000.$

----- Forwarded message -----

From: **fiston tshingombe** <tshingombe520@gmail.com>

Date: Wed, 27 Apr 2022, 14:32

Subject: Electrotech

To: fiston tshingombe <tshingombe520@gmail.com>

regulatory factor low

Ruling table electro sylogysm . Educare tech educational tech binary

calculation electro logic process

electro binairy ..mathe science

Electro syslogysme .

$00000000+0000000=00000000$

$111111111+11111111=22222222/$ vs1111111/ base 10101010101010

$111111111-11111111=00000000$

$111111111x11111111\textcircled{c}=111111111$

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$11111111 \times 22222222=11111111$

$11111111:22222222=2222222$ convert 1010101010101010

Electro syslogysme reson . judgement convert.process inputs output $a+b$
more less

$22222222+22222222=44444444$ convert unity ..base binary
001.001001001001001001001001

$22222222-22222222=00000000$

$22222222 \times 22222222=44444444$

Convert system base binary

$22222222:22222222=11111111$

Call contact electrotech syslogysme

Switch vs relay delay dimer. Process circuit active passive

Data electrosylogym deduction reasoning

Input output process in out data storage

Ka:11111111+kB 11111111= ka+kB 22222222

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current 0r1 voltage 6-v;6v +.. current ma arguments arguments deduction
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ka+kb11110000... value electro sylogism connector concept clock wise
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-Reason integration circuits

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DX./dy.. Di)..Du/di.di/dt. .limited Lim functional binary

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Ka dr DX i000000+k b dr 0000000=000000.

Integ ka+kB Du 0000000.

Expo 00000000"00+0000000"00=DX ka .oO(00000000)"0_1..reson
derivation binary electro sylogism .rational database Integration
primitives binary re initial system clock derivative .power am voltage

Log base 11111111 "oo=0000000.. sylogisme electrotech binary .
Integrated binary Lim x binary value 0000000 function kB 2x+ka
11111111=11111111 fifth lineard octal system designed .. resistivity
electrology reactance x sylogisme ration .relation. Logic electro logic
binary

Assessment assemble binary application binary electrotech .in low

fiston tshingombe
<tshingombe520@gmail.com>

Wed, Apr 27, 5:50 PM (11
days ago)

**department of science and innovation socio economic
development,**

**-1 .programme administration technology innovation
international cooperation**

**Gov , city power and St peace college
Programme, exposition science**

-2.programme research development support :

**St peace college lecture and learner development under planning.
Department high Education vs saqa vs qcto,vs seta research resolved
time table examination Assessment police , Portfolio documents
systems integrity police academic,**

**-2.1. purpose: innovation practical and theoretical. science and
technology science national** trade factor outcome time table trading
examination and qualification framework national diploma n engineering
and council trade sector authority , innovation system outcomes
empower system subject entry phase learning and lecture teach
science exhibition generation technology Assessment police ,and
Engineering assessment trade machine and trade control system
process project system control evaluation system

**2.1.2 knowledge: innovation practical and theoretical trade
technology electrical engineering Electrotechnology empower
value are recreation orientation maximum,** value tax , return
studies and

Examine electro technology engineering time table assessment
Completed research lanieries system technology value entry lecture
exam nated vs. saqa vs qcto linearism system electro technology power
fundamental job duty job maximum, job value minimum trade
operational, task minim component system,

-Job duty cycle system value : learner lecture framework qualification and
occupation trade job value salary resource human maximum fiscality
minimum technology components system : sciences natural system
investigation design minimum agreement value job trade module,task
minimum ,task minimum service require trading sectors and maximum
sectoral electrotechnology trading components

Value financial tax system:

2.2.3: strategies: strategies phasing module tasking curriculum system implantation levels grading lecture

objectivity:

The trading lecture and learning system engineering science electrical subject and technology electrical ,electro technology ,education technology

System outcome , trading education technology systems power factor demand system education , efficiency system assignment power objectivity module task , maximize inventories psychopedagogic metric system month week of observations learner form test assessment assignment control tpm maintenance meeting product control technology goal .

-1.2.3.4: development humain generation: system teaches sector organisations technology rate value maximum rate demand factor admnise value ask required report system value.

-1.2.5.component: trading lecture used company manufacture relate system Industrial Education system intelligence management system information ,education computing control system switch and material support command disposition component manufacturers

Numerical time table framework regulatory Education trade relate handbook guideline information and orientation integrative system component handbook relate maintenance update , upgrade system

-1.2.6: basic science infrastructure: implantation of research innovation mission equipment

College equipment framework theory practical lab workshop workplace implantation department gov system ,more

Inovation,tax incentives,,
Meeting request

-National energie regulatory of South Africa mandatory electricity piped , invitation me minister tribunal,,

Meeting electrical conformance board design installer regulatory Cox competition b

Meeting salt .dmrg stick ,sale revenue power plant fuel used national treasure sars department of energy mandatory ensure private sector participr in power generation ,

Meet national skill fund,, national research fund ,,
Visa permit

tshingombe fiston
<tshingombefiston@gmail.com>

Wed, Sep
20,

5:31 PM
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to **TSHINGOMBEKB, tshingombe**, DSI-
Notification

partment of science and innovation socio economic development,

-1 .programme administration technology innovation international
cooperation

Gov , city power and St peace college

Programe, exposition science

-2.programme research development support :

St peace college lecture and learner development under planing.
Department high Education vs saqa vs qcto,vs seta research resolved time
table examination Assessment police , Portofilio documents systeme
integrity police academic,

-2.1. purpose : inovation practical and theoretical. science and technology
science national trade factor outcome time table trading examination and
qualifition framework national diploma n engineering and council trade
sector authority , inovation system outcomes empower system subject entry
phase learning and lecture teach science exhibition generation technology
Assessment police ,and Engineering assessment trade machine and trade
control system process project system controle evaluation system

2.1.2 knowledge: inovation practical and theoretical trade technology
electrical engineering Electrotechnolgy empower value are recreation
orientation maximum,value tax , return studies and

Examin electrotechnology engineering time table assessment

Completed research linearise system technology value entry lecture exam

nated vs saqa vs qcto linearise system electrotechnology power fundamental job duty job maximum,job value minimum trade operational,task minimum component system,

-Job duty cycle system value : learner lecture framework qualification and occupation trade job value salary resource humain maximum fiscality minimum technology components system : sciences natural system investigation design minimum agreement value job trade module,task minimum ,task minimum service require trading sectors and maximum sectoral electrotechnology trading components

Value financial tax system:

2.2.3: strategies: strategies phasing module tasking curriculum system implentation levels grading lecture

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-1.2.6: basic scieny infractuture: implentation of research inovation mission equipment

College equipment framework theory practical lab workshop workplace implentation department gov system ,more

Innovation, tax incentives,,

Meeting request

-National energy regulatory of South Africa mandatory electricity piped ,
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competition b

Meeting salt .dmrg stick ,sale revenue n power plant fuel used national
treasury department of energy mandatory ensure private sector
participate in power generation ,

Meet national skill fund,, national research fund ,,

Visa permit



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<tshingombefiston@gmail.com>

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to **csd**, DSI-
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Wed, Sep 27, 5:21 PM (3
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to **TSHINGOMBEKB, tshingombe**, DSI-
Notification

Technology design engineering,systems engineering,



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<tshingombefiston@gmail.com>

Wed, Sep 27, 5:22 PM (3
days ago)

to **tshitaditshingombe**, DSI-Notification,
TSHINGOMBEKB, tshingombe



Mail

Delivery Wed, Sep 27, 5:23 PM (3
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m

Address not found Your message wasn't delivered to
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Wed, Sep 27, 8:55 PM (3
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to **DSI-Notification, TSHINGOMBEKB,**
tshingombe

1..project

-High school theory practice week grade

Theory labo work shop high school ,

- university theory practice workshop lab

- instituts case studies research

-college workshop workplace theory compagny workshop experience career

: projection design analyse

-Project Principe design

-project diagram laballed schematic

-Projects diagrams power circuit

-Project commander control way

-Project experience measure test

.diagramme algorigramme logigramme organigramme ,diagrammed sequential ,

Concept design planogramme, algorithm . Graphcetp

- purpose engineering,

1.initial sequence implentation

1. purpose of plan. Dhet yes,

key switch contact

-aim of plan yes,

-objectivity plan yes

- key delivery area

2.implementation monitoring of teaching

--purpose yes

- trade test QCTO license yes ,let /lep

3purpose.

-4 purpose and evaluation saqa log

- 5where appropriate , undertake manufacture maintenance panel yes

-6.1 Value Assessment saqa vs NC's infractuture.

7

7.purpose dhet education career bridge stabi base phase job paychomoty
yes

-8 dhet ,vs sasseta accreditation Assessment mil STD , safety training
merseta required gasst .

-8.2

9. purpose manufacture relate theory practical componey equipment trade
ton max chain load diameter trade code objy credit theory vs practice test
manufacture yes,

-10.purpose dhet national electronics fundamental engineering level and
License trade engineering.

Compare low test methode notion Hopkins

-Purpose wiring electric wire way premise protection line fire

-10.2 purpose engineering science module completed algebraic linearing

foundamental system process fabric y yes,

-engineering science theory fundamental research step y learner plan
lecture plan mapping investigation Analyse,

11.purpose instrument measure trade engineering e measure control lab ,

-1.2 dhet vs saqa practical work experience lab workshop workplace
Industrial trade purpose machine manufacturers..

-13. Dhet ncv nated lect vs saqa subject electrical principle practice , nqf
level,

14.purpose dhet et vs seta sassetta skill programme management
electronics,security assess threat for installation ,

15.purpose student information system,student managy system revolutionized,
and steering wit,cost effective interactive,collect.



tshingombe fiston
<tshingombefiston@gmail.com>

Wed, Sep 27, 9:13 PM (3
days ago)

to DSI-Notification, TSHINGOMBEKB,
tshingombe

- diagram logigram algorithme

-initialisation : start

-implementation curriculum knowledge curriculum policy engineering planning
product improvement contractual agreement e registerer and consultant e
electrique Computer. Yes

2.purpose ask factor career outcome transition phase learner phase exhibition phases teach beginning. Yes

3.method material and equipment scientific guidelines assess formation Summative rubric tools assessment learner and teacher time e. Yes

4.result nantecht and minint what is technology wath are day of mining how is nanotechnology energy. Yes

4.conclusion : ent discovery Computer training t and support services to existing or prospective club safe.

5 .

1.research plan template yes,

1.1 scientific investigation project experimental. Yes

1.2 engineering type project and computer science.yes

-provisional project implementation framework policy college and school Engineering circular assessment police , Education teach and technology subject ,subject , government municipality team training work graduation Engineering time St peace project,expos categories..

-method material .

- procedure each operational preliminary synchtins inspect.



tshingombe fiston
<tshingombefiston@gmail.com>

Wed, Sep 27, 11:05 PM (3 days ago)

to DSI-Notification, TSHINGOMBEKB,
tshingombe

-Project, CVS, resume

Logigramme

-1. engineering electrical implentation time table to job time experience
trade .

yes.

-education study program St peace college.yes

-work expert: title position city power training / St peace college training
02/2923.

Engineering electrical visited work training experiemental tasks ,

- award degree diploma ,saqa award panel wiring electrical , yes

-skill panel wiring electrical ,

yes

-personal projects engineering electrical visited / St peace college city power
,04/2023 ,award certificate diplomat saqa engineering.yes

-organization ,St peace city studies statement yes ,12 / 2022 present
engineering subject n1,n2,n3,n4,n5,n6, ,n ,,

1.1summary .

-1.1scope : research implentation framework study theory pracky
Engineering study time table Assessment allocatt implentation framework
regulatority in government experimt student case time that allocation
research,

-Abstral students engineering design analysis trade ask knowledge city
power municipality power electrique metering ..

-tvét CV instruction icass planning internal assessment Assessment plan
subject, student analyse grid lectuy file , assessment test practical
Assessment,rubrt, yes.

1. Research requirements job study content.

Research job implementation time table mean government instant visited
visited labour department visited s energy council engineering. Yes

.-question ask city power years theoretical practical city power and energy
mineral department college, research job basic ady eligibility CVS selection
crity factor training visiby appointment dicuy walleti Portofolio education
college working work eligibility.. yes

- 1.2 research engineering role and responsibilities research team ideal
realities interested research and create new technology. Yes

-1.3 duty of area search engineering years depending type of position.

-engineering overseas staff position advance seniors. Yes

4.electrical ent do design and building Electrical equipment advance
technology outcom including.yes

5.assessment guidelines orientation vocational Engineering ,conductor
learner Engineering learner except emploie.

6. Requirements Assessment police and orientation learner guidelines
vocational training engineering electrical,

7.requirement power meter technical Metering, calibration laboraisa s class
0,2, single phase certifat accreditation IEC ,@70 SaaS la capacity to
calibrating large voluy electrical meter provide value meter .. yes

7.2.tesring desktop applicat police infort managet systt society low
management criminals record infot Manuel improve a desk top application
record jeet for police St is securite and functt safeware system department.
Yes

7.research integrity framework college project and university School topic
policy assy orientation Assessment research outcom teach lecture. Yes

8.tender value career totat education trade consultant bodies insuttrade test
exam nated duty n 1-n6 marks time table theory.

1.scope research

1.2.

1.3 purpose overview in developing compt tendered city power supplies engineering electrical Cass study,

-1.4 requirements training time table.

1.5 ask answers theory practical visited plant operations experiemental assessor in workplace labor questionnaire asked analyse subject working in developing trading company responsible ,

-appropriate sole Consol class cicate support trading training..

1.6 ask quesys power to integrate sector training was satisfactory in gate information for training city power metering customer need to trade customer technology module trade t.

1.7. step need cost customer power factor theory compagny supplies need tax consumer supplies..

@.8 operationel support rendered.

-to compliance labor electriy power factor test inspection compliance time table relation test installation electrical metering single phasst test trade certificate.

2.1.14.operational preliminary case study visited power city operationel requirements.

2.1.4.1 permit allowed minimum job career student permit study BT's training allocation minimum..

21.4.2 , questionnaire fact ask student in plant dangerous.

2.1

4.3 ask factor permit ..

2.1.4.2 student city power and training to delivery bill information system

integration.

2

.14.6. Student city power and training to delivery bill information system.financial implentation in system exam to more gov , development social..

2.1.4.6 metering moduttrade theory electrotech resembles instrument measure informat management syst framework commut skill mathematics Engineering.

3.1..4 , student homework,

1.4.6.1 faculty allowed system engineering lab workshop

1.14.6.2 to ,1.1.4.6 metering implentation time table module gov system..

9.procide contextual information city power and St peace student Engineering electrical research.

9.8. compared resultat obtained statement visited investigation metering peace college time t learner.

,4.2. requirements appointment plant engineering electrical consultant provision professional.

- specifical IST application.

2.1 implentation frame work regulatority

5.2 case study circular visited compared inovation.

5.2.1 module inducty safety join soldering fauy find contrase.

6.engineering. N diplomat dtin.

9.1.9.2 feedback guyser control meter readlig schedule tarrif info prepaid vendit type fault logging load shedding Libra tarrif monthly metering.

11.metering errt connet prepaid over load power accident appliances metering consumer procedure claim fault crime logged call off metering.

12. Generation measures network transmission syt time table engineering electrical, physics ,chemical eny,science engineering, drawing Engineering,apply to Cary career outcot skills to make a freelancer arrangements power city training visited engineering estimate resolution,add system explat resonement. Yes

13.2. engu system modelit n asstfor entpolice St peace was concert lectt introdu topics guide visited city power key learner appropriate, yes

14.22. Engineering electrical specifications of machinery equipment motor machinery generation battery.cerufucariin cycle durat yes..

14.28 .compare training assessment and assugu electrique implentation time table workplace workshop academic in trade social power design factor training..yes

15.reqyieed manager class how to orgat.

15.requiremenr implentation and stabilization to training visited training Education exam training and labour inspection work inspection police school Industrial city ..

- n diplot saqa understaking numerical,

40.1 practical school St peace college workplace workclass class at peace practical.orientation .

50.1 built making ,

Subject module overview colleges lab workshop ttheory police ..city power



tshingombe fiston
<tshingombefiston@gmail.com>

Thu, Sep 28, 4:28 PM (2 days ago)

to DSI-Notification, TSHINGOMBEKB,
tshingombe

1

.CVS Title government and Education job Engineering college.

1.conte t engineering electrical career project Project officer outcom e
legislation government engineering gov city .yes

2.2 abstract job work career category job skills.yes

3. Entry Engineering electrical trade infractuture implentation support. Yes

4. Purpose assessor .vyes

4.1 case study how make calculation for a distribution substation.

Yes

- 5.requirement substation , 5 purpose and required , advance basic.

Yes

6. Requirements power station and central system appliances TV reliable ,

Yes

8.requirement Dimensioning workplace.

Yes

8.2 fonctionalite principal .

Note cacul office , bureau studi ,sabs ,ECB,realii calcul test

Yes

9.reauired domain application distribution network .

Yes

10.of electromagnetic induction to solve problem.

Yes

11required energy dimensioning,

Yes

15.1 rate discharge required need adjusting energy determine secondt control power requirements.

Yes

16. Required functions function.

Yes

17. Required report current measurement.

18.required energitcal energy and electro energy mass government weight Gass products.

Yes

19.1 ..circuit diagram of analyse energy meter ,

ATM term standard automate teller machine.

20.require case diagrams for arm systeme.

Yes

2.1 required ent Electrical machinery motory motor and generation

Nomenclature assembly,step

Yes

2.2 required calculation of induction in the teeth of stator.

- required ,an experiment in in transformer rewinding an winding
instructable.step

2.5 requirements engineering electrical work department orientation
wastage life assess life cycle analyse is methology association commercial
products or services for instance case of manufacture product impact are
Assessment form row material.

Recycling final.

- seta form assessor saqa

- city power structure organisation inovation.

-Strong cities network ,

- Education and for innovation power of digital technologies,

-30.. required design analysis Engineering science energy, engineering
chemistry, engineering physics biophysics science electrical energy..

30.1 robot dynamic kinematics and control calcule Dimensioning
nomenclature operator kinematics.

30.2 requires Industrial research means planned research critel innovative
grow ,equity components compagny appliances sti stick reports.

32.rewuire total energy systems required load current at point engineering
electrical faculty



tshingom Thu, Sep 28, 5:03 PM (2
be fiston days ago)

-Requirements flow down from level1.system design processes1.1
requirements definition process ,1.1.1stskehold expectation definition
yes1.1.3technical solution



tshingombe fiston
<tshingombefiston@gmail.com>

Fri, Sep 29, 7:19 PM (14
hours ago)

to DSI-Notification, TSHINGOMBEKB,
tshingombe

-Algorigramme, logigram

-Key lock,,

-Equation key equation lock comparable logic

K1.1 x +k.2.1+kn ..= k implentation

K1.1x+k.2.1+kn..=k.implementation

Add. Method value :

Substitute value: key

Compare value :

Step operator ..

Way key switch

K.1.



tshingombe fiston
<tshingombefiston@gmail.com>

Fri, Sep 29, 9:14 PM (12
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to **TSHINGOMBEKB, tshingombe**, DSI-
Notification

Outcome, education technology technology electrique ,electrotechnology
EIC

EIC : electrotechnology : electrical international commissioner rules ,

Commissioner electrical international,commission energy,,commission
lighthning,, system international physic ,chemical ,,

Construction electric association ,information rules

Labels,

Power empower : fundamental system, process implentation phase
operationel step task project:

Schematic diagram: principal game

Technologie ,supplies power purpose power : rules attorney: machine
system control process Project fabric.

- power commissioning code standard

Value nominal operationel work :

-value minimal operationel work labour:

-value value cut operationel ,

Value selected , choice basic advanced purpose diagram design Key lock

contacting value outcom technologie are Cree.

-principle schematic: schedule

Orientation projection flow share line manager system process purpose
horizontal vertical team line flow

-Purpose purpose : 1.1,,1.2,,1.3,,1

5.. operationel task ,logic diagram logigram , organigramme organisation
orientation planing supervisor

- design organigramme:

Way key switch organisation supervisor planing way , 2 way ,3,way block
Mono schedule schematic,4 way switch suplie power recall delay relay
o'clock dimer

-Organigramme schematic blocks,convert information :

„Organigramme board metering , logigram , algorigramme.bod distribution
board , distribution system design .

- equation logic : state logic ,0or 1, voltage 220,380

$F1=0, F2=0, F3=0$, circuit breaker MCB

$MCB1=0, MCB2=0, MCB=3$, Line 1,2,3 state = 0,

$F1+F2+F3$, ,metering kWh=0 , kvarh=0,KVA =o cos meter= 0

Circuit breaker ,over load rcdbo =0,

Db box system db=0, operationel technologie,

Equation logic

$Db = F1.+MCB+kvar+kwh$

Power supply,

$Db = \text{lights} + \text{outlet socket} + \text{guyzer} +$

Sw1=1 light = 1, sw2=1,sw3=1,SW 6, ,SW 5,

- organisation

dol ,reverse. Load.

Km1= F1+so+(S1+km1). Motor

Km2=F2+s0(S2+km2)..

K1m = F1+so(S1+km1).km2

K2m=f2+so(S2+km2).km1

K start= F1+so(S1+km1).k d

K delta=F2+so(S1+km2).ks

On line generator ,,transformer

transmitters

Kgenerator =F1+so(S1+kg1).kg 2

Kgenerator=F2+so(s2+kg2).kg.2

Transformer = F,=,1,(Q+break+Q).(Q+break+Q)+transfo + Q+Brak+Q+

-Algorigramme: operationel system

Initial f1.start ..F1=1 yes , or not initialisation,F2=1,yes ,or equal =o initial

Initiation , f 3=1,yes or equal=0 initial ,

.,SW = 1:,yes ,,km = 1, yes,kg=1 yes step or reininitialisatiin .

Db box = ,1 ,,D's=,1 activation atstem

End procedure ,,

Logigramme algebraic boolean ,

Coventer

Binaire 2. 0,1,decimal base 10, hexadecimal 16,

Input / out put logic byt

Sw1=0,sw2=0,sw3=0,SW=0/ 0000,

Base 10,,base 16

S1=0,S2=0,S3=0, S4=0,=0/0000

Km=0,km=0,km=o,km=0,/0000

Kg=0,kg=0,km=0,Km=0/ 0000

,

Fortran

CLS program,PLC

10.Print sw1

20.Print sw2

30.print sw3

40.print sw4

50 print S1,

60 print S2

70 print S3

80 print s4

90 print km

100 .print kg

110.print t

Input ="sw1", sw2,sw3,sw4,Se

Input = S1, S2,S4,S4,,

Input = km,

Input = kg

If " sw1"= 1, l =

Else

Show

String

Robotic research operationel

Algo pin address value scater position

-

-



tshingombe fiston
<tshingombefiston@gmail.com>

Fri, Sep 29, 11:40 PM (10
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to DSI-Notification, TSHINGOMBEKB,
tshingombe

Analyse design ,analyse circuit.

Sequence , circulum purpose

- call key display sw1,sw2,sw3,sw4

-call and recall ,db ,Q

- call and recall current sw1,sw2,sw4

- call way key

+ Call km,call kg ,call.

-Module call and recall sw1 task ,call task ,sw2 ,call task sw1 required
contact task sw1 = 0, sw1=0,

Task km

Call presson pressosta kp,call manosta ,call detector call,termomete kt
Relay

Current exp

-Module calculator operationel, call task ,call , sw1 operationel logic add, subtraction , multiplication,division task

Module inverter ,module multiplex ,

Integration circuit module switch

,

Call pression under pressure,

Call , module calcule step task ,S2,S2,s3s4,sequence pression ,selector

Call pin address ,transistor thyristor comande task ,

Call module matrices

,Display module.. operationel system call recall task ,multi task multi use, mmono task, call windows,, operating system call motor lecture current disc tape magnetic electromagnetic memory card , reader card call ,sub system

-

BY TSHINGOMBE TSHITADI STUDY :

RESEARCH SAQA QUALIFICATION.

- Final award certificate(s)
- Academic transcript(s)
- Original documents
- Sworn document(s) translation(s)

FINAL AWARD DEGREE DIPLOMAT 1TH, 2TH,

CIRCULUM ASSESSMENT FRAMEWORK SAQA QUALIFICATION
AUTHORITY

INSTITUT VERIFICATION QUALITY CONTROL ASSESSMENT
SUMMATIVE, FORMATIVE, SUPPLEMENTAIRY EXTRA TIME TABLE

HIGH EDUCATION SOUTH AFRICAN DEPARTMENT

CIRCULUM ASSEMENT : N4-N6

st peace college
filing

NAME/ LEARNER : TSHINGOMBE -TSHITADI

MODERATOR: MR BENJAMIN

ASSESSOR POL/ ENGI: MR JACSON

DIRECTOR: MANAGER /PRICIPAL: CONIE



ST PEACE COLLEGE / AND A I P

FACULTY : ELECTRICAL ENGINEERING

ID : EVALUATION SAQA APPLICATION 20191130002

_____ , 202001305040/ 201911130002

ID: N1-N2, N3/N4/N5/N6, N 2010002023812 /
2004007064381 /2011007434332 NATIONAL EXAMINATION

HIGHER. EDUCATION QUALIFICATION

-FINAL AWARD (DEGREE / DIPLOMAT CERTIFICATE) SUBMITTED
1STH/

- NO PROVISIONAL CERTIFICATE OR UNOFFICIAL STATEMENTS

-CERTIFICATE NO SUBMITTED 1TH

-OFFICIAL STATEMENT FROM INSTITUTION

- DIPLOMAT D'ETAT EXAM CERTIFICATE / NO SUBMITTED

-ID: N1-N2, N3/N4/N5/N6, N 2010002023812 /
2004007064381 /2011007434332 NATIONAL EXAMINATION

- REGISTRAR CERTIFICATE NO: COM 18269001: /

- ST PEACE COLLEGE LEVEL N 'ENGINEERING CERTIFICATE
LEVEL 1,2,3,4, REGISTRAR CERTIFICATE NO: COM 18269001:

-FINAL DEGREE/ DIPLOMAT DEGREE SAQA N6 NQF 6/
NQF7 / NQF8 CONTINUE

- SAQA UNIVERSITY DEGREE 1, 2, 3, 4 NQF7/ NQF8 ,
SUPPLEMENTARY PREPARATORY SELECTOR DIPLOMAT

-REGISTRAR FEES: FINAL EXAM DIPLOMAT N / SAQA 50%

-REGISTRAR FEES FINAL



ST PEACE COLLEGE / AND A I P

FACULT: ELECTRICAL ENGINEERING

TIME TABLE , / Study by tshingombe tshitadi fiston

learner: conies

Moderator facilitator instructor: sasseta, seta: security training safety, strategies

Trainer performance train training. Manage electronic system :, assessment

Learner: khruis /...

Faculty: engineering electrical

MENTORING CAREER LEARNER : GUIDENCE ASSESSMENT POLICE SOCIAL PSYCHOLOGIE , INDUCTION LEARNER CONDUCT

ASSESSMENT . MANAGEMENT PRINCIPAL OFFICER DUTY
RESPONSABILITY LEARNER , STUDENT COLEGE SUBMISSION
CAREER GUIDENCE QUALITY CONTROL MANAGEMENT
ORIENTATION MANUEL , SYTEM

MANUEL FOLLOW, MANAGEMENT SYSTEM OPERATIONEL

PRESENT ORAL LEARNER ELECTRICAL ENGINEERING

SAINT PEACE COLLEGE : EXAM DIPLOMAT

N4- N6 --

EXAMINATION AWARD DEGRE DIPLOMAT ENGINEERING ,
DIPLOMA

- ASSESSMENT POLICE ,
- ASSESSMENT LABOUR PROCEDURE POLICE SKILL
DEVLOPMENT ARTISANT :
- ASSESSMENT TRAINING PROCESS EDUCATION
- ASASSEMENT HEALTH ENGINEERING SCIECENCE

OHS 3/1/4/6 DEPARTMENT OF LABOUR OCCUPATIONAL HEALTH AND
SAFETY ACT, 1993 EXAMINATIONS FOR THE MECHANICAL AND
ELECTRICAL ENGINEERS CERTIFICATES OF COMPETENCY
(FACTORIES)

NAME STUDENT RESEARCH: TSHINGOMBE TSHITADI

LEARNER TSHINGOMBE

**-PERMIT WORK STUDY RESEARCH, EXAMINATOR NATIONAL
AWARD CERTIFICATE DIPLOMAT**

MODERATOR MARK

CHIEF MARKING GUIDELINE

COUNCIL EDUCATION

**PERMIT WORK LEARNER QUALIFICATION AWARD DEGRE
DIPLOMAT**

**PERMIT STUDIE ACADEMIC INSTITUTE RESEARCH
PERMITCAREER VOCATIONEL BASIC ADVANCED FILING
SYSTEM**

MANAGEMENT PRINCIPAL

**SUBMISSION LECTURE NOTE SELF ASSEMENT POE'S PEER
ASSESEMENT, GROUPE ASSEMMENT, SCOOTISH**

Content page:

-topics

Abstral : Overview: Statement national system examination and qualification system framework regulator overview knowledge application and finalise with system rural land reform council quality control process on high education system and universities system need energetically for work in the time system real and take most imaginary system energetically scientific discovery on the end of the day system

1. Purpose:

THE END OVER OF CONCILLIATION SYSTEM COMMMISIONING SYSTEM ARBITARL

Statement national load credit and accreditation booking and bookkeeping journal inventory delivery note claim academics system need resold agreement minimal wage on framework system reform provisional

Site situation land reform geostrategic zone sartorial

Climatic legend system

2. Topic 1. Circular research question rural development energetically

2.1 Frame work regulatory system provisional supply logistic land reform rural sector energetically system support ;

Overview: Statement national system examination and qualification system framework regulator overview

2.2 System : case study report occurred sartorial programme site rural technical vocational support study frame work regulatory implementation mandatory system policy design case compliance existence fundamental support municipality country continental system development task unity qualification system vocation technical system implementation support electro energetically system support zone rural , management system information safety security system keep zone in fire rural electro energetically in fire energetically renewable . regulatory research analyse design framework implementation improvement subject, field engineering studied examination circular integration and system rural zone protection device case study structural energetically claim, zone rural land reform tenure extender supply ,

2.2. Case study electro energetically stability and static report occur zone safety survey civil geotechnical rural sartorial site skill administer communication stress health occupation system workplace skill goal target occurred system ob , delivery service multi sartorial rural electro energetically un stability system stress health skill score , constant annual report implementation system require land reform energetically bridge reform system . Evidence of the low value portfolio supply rural claim development system tom implantation antennae remanufacture system fundamental energetically, rezoning system support .

2.3 Case study electro energetically rural system trainee support , training support skill system learned management system induction learner new job , and old job system resource management human , investigate system electro energetically, system stability framework regulator legislation mandatory compulsory system safety zone prevention rural system review existence firm joint venture existence system implementation energetically . Stability manual occurred zone statistical security severity give impact financial required system rural resolution incorporation zone break down time table, allocation system minimise risk. System

2.4 Case study energetically problematical man dement: cost projection, review retrospect us, re projection cost estimation planning organisational industrial stature,

Production management system require review, rural, land reform view

Time table subject

Resource allocation value break down system

POWER SIZE WORKPLACE, CLASS ROOM STUDY TRAINING /
REGULARITY IRRREGULARITY ATTANDANCE SUPPLY ENERGETICAL,

X1 X2 X3 X4 X5 X6 X7 X8

1y

2y

3y

4y

5y

6y

7y

Sum

X+yi= 0 joint
relation module
subject argument

Reason
energetical

Square linear
energetical
compare

$A+bi=0$

$X^2+bi^2+c=o$

$B^2-4ac/2c$,
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Matrice

Energetically

/Det/

$x_1+y_1+z_1=0,,$

$x+y=o,,, (1)$

$x+y=0 (2) \quad x-y=0$

$X^2+y^2+z^3=0$

$X^3+y^3+z^3=0$

$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

Integral / limited
continuïte
number

energetical

$\lim_{x \rightarrow y=0} f(x)$

X

du/dv

Dx/dy

Dx/dy second

Log / ln

$Dx/dy \quad dy/dz$

Inte/ \int □.

Relation equation

energetical

electrotech /

E1-

$E2 = 1R1I + 2R2I + 3R3I$

E1-

$E3 = 1R1I + 2R2I + 2R2I$

$E = RI, \quad r = l_0$

$X_L = L\omega \quad , \quad X_C = 1/\omega C$

$Z = \sqrt{R^2 + (\omega L)^2}$

$Z \cos \phi = R + 1/\omega C$,

$p = v_i$

$P = v \cdot i \cos \phi$

$V_L = i_L \cdot \omega L$, $v_e =$

$R_{ms} =$

$R_p = 1 / (1/r + 1/r_1)$

$R_s = r_1 + r_2 + r_3$

$N = 2p/2$

$$S =$$

$$C = qv /$$

Relation
energetical
science
engineering

$$\text{Power} =$$

$$v = u + at,,$$

$$f = ma + mg$$

$$f_u = F \cos .mg$$

$$E = mc^2$$

$$E_k = 1/2 mhg$$

$$E_{at} = m.c.(t_1 + t_2)$$

$$m.c = mc.(t_1 + t_2)$$

$$p = f/s$$

$$F_{xl} = f_{xl}$$

$$P = wxt$$

$$E = pxt$$

Relation
imaginair/ real

$$X + yi = 0.,$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$X = r$$

$$Y = ri$$

$$I = j\sqrt{3} \cdot \Delta ,$$

start vl,

$$V = v\sqrt{3}.$$

$$V_{cc} = I_{cc} \cdot R_{cc}.$$

Theveni , rt .

northon

$$P=v.i.\cos.t$$

$$Q=v.i.\sin.t$$

Tree phase
delta , star
conexction
average ,

$$v=v\sin.t.$$

$$rms=0.777 \text{ r.}$$

$$Av=0.666.r/ \text{ form}$$

/

$$P= v\sqrt{3}.i.\sin.t /v.$$
$$j\sqrt{3}. Si.t$$

$$Q= v\sqrt{3}..i .\sin.t/ v.$$
$$j\sqrt{3}.$$

$$S=v.i$$

$$E=p.t/$$

Energy ave/ =

<u>X1</u>	<u>X2</u>	<u>X3</u>	<u>X4</u>	<u>X5</u>	<u>X6</u>	<u>X7</u>	<u>X8</u>	<u>X9</u>	<u>X10</u>
<u>Y1</u>									
<u>Y2</u>									
<u>Y3</u>									
<u>Y4</u>									
<u>Y5</u>									
<u>produce</u>									
X+yi= 0 joint relation module subject argument Reason energetical									
Square linear									

energetically

compare

$$A+bi=0$$

$$X^2+bi^2+c=o$$

$$B^2-4ac/2c$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Matrices

Energetical

/Det/

$$x_1+y_1+z_1=0,,$$

$$x+y=o,,, (1)$$

$$x+y=0 (2) \quad x-$$

$$y=0$$

$$X^2+y^2+z^3=0$$

$$X^3+y^3+z^3=0$$

$$\begin{matrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}$$

$$\begin{matrix} 0 & 1 & 0 \\ 0 & 0 & 1 \end{matrix}$$

$$\begin{matrix} 0 & 0 & 1 \end{matrix}$$

Integral /

limited

continuïte

number

nergetical

$$\lim_{x \rightarrow 0} x+y=0 \quad f(x)$$

X

du/dv

Dx/dy

Dx/dy second

Log / ln

Dx/dy dy/dz

Inte/∫ □.

Relation

equation

energetical

electrotech /

E1-

$$E_2=1R_1I+2R_2I+$$

$$3R_3I$$

E1-

$$E_3=1R_1I+2R_2I+$$

$$2R_2I$$

$$E=RI,, \quad r=lo$$

$$Xl=Lw \quad f, \quad xc=2$$

f

$$Z=\sqrt{R+lw}$$

$Z_{\square} = R + 1/cw$,
 $p = v_i$
 $P = v.i \cos$
 $V_l = i_l, \text{ ave} =$
 $R_{ms} =$
 $R_p = 1 / 1/r + r_1$
 $R_s = r_1 + r_2 + r_3$
 $N = 2p/2$
 $S =$
 $C = qv /$
 Relaion
 energetical
 science
 engineering
 Power =
 $v = u + at,,$
 $f = ma + mg$
 $f_u = F \cos .mg$
 $E = mc^2$
 $E_k = 1/2 mhg$
 $E_{at} = m.c.(t_1 + t_2)$
 $m.c = mc.(t_1 + t_2)$
 $'p = f/s$
 $F_{xl} = f_{xl}$
 $P = wxt$
 $E = pxt$
 Relation
 imaginary/ real
 $X + yi = 0.,$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

 $X = r$
 $Y = ri$
 $I = j\sqrt{3}. \Delta$,
 start v_l ,
 $V = v\sqrt{3}.$
 $V_{cc} = I_{cc}. R_{cc}.$
 Theveni , r_t .
 northon
 $P = v.i.\cos.t$
 $Q = v.i.\sin.t$
 Tree phase
 delta , star
 conexction
 average ,
 $v = v\sin.t.$
 $r_{ms} = 0.777 r.$
 $A_v = 0.666.r/$

form / $P = \frac{v\sqrt{3}.i.\sin.t}{v}$ $j\sqrt{3}. Si.t$ $Q = \frac{v\sqrt{3}..i .\sin.t}{v}$ $j\sqrt{3}.$ $S=v.i$ $E=p.t/$ Energy ave/ =									
<u>Midpoint, series, sum number average.</u>									

**Psychometric accumulation energetical , real energetical ,
imaginarie energetical , intelligence energetically , relation
grouped, model x, didactic modelling ,ortho pedagogic ,
projecting view, educate care inspection maintenance, develop
supply manufacture**

Relation fundamental / system energetically

$X+yi= 0$ joint relation module subject argument Reason energetical Square linear energetically compare $A+bi=0$ $X^2+bi^2+c=o$ $B^2-4ac/2c , \frac{-b \pm \sqrt{b^2-4ac}}{2a}$	Defence factor norm eic / call Work , shift salary require task week 7 days , 30 days time work energetically , over time , daily energetically time operational net operation weight operational load purchase .TERM 1,2,3,4 2 semester air time award credit balance stability , 36000 second, 4, module 24 module, 36 module accumulator
---	---

Matrice**Energetically**/Det/ $x_1+y_1+z_1=0,, \quad x+y=0,,$ (1) $x+y=0$ (2) $x-y=0$ $X_2+y_2+z_3=0$ $X_3+y_3+z_3=0$

1 0 0

0 1 0

0 0 1

**Integral / limited continuite
number nergetical****Lim $x+y=0$ $f(x)$** **X****du/dv****Dx/dy****Dx/dy second****Log / ln****Dx/dy dy/dz****Inte/ \int \square .****Relation equation energetical
electrotech /** **$E_1-E_2=1R_1I+2R_2I+3R_3I$** **$E_1-E_3=1R_1I+2R_2I+2R_2I$** **$E=RI,, \quad r=lo$** **$Xl=Lw \quad f, \quad xc=2 \quad f$** **$Z=\sqrt{\square}R+lw$** **$Z\sqrt{\square}=R+1/cw, \quad p=vi$** **$P=v.i \cos$** **$Vl=il, \quad ave=$** **Rms =** **$Rp= 1/ 1/r+r1$** **$Rs=r1+r2+r3$** **$N= 2p/2$** **S=** **$C=qv /$** **Relaion energetical science
engineering****Power =** **$v=u+at,, \quad f=ma+mg$** **$fu=F \cos .mg$** **$E=mc^2$** **$E_k = 1/2 mhg$** **$E_{at}=m.c.(t1+t2)$** **$m.c=mc.(t1+t2)$** **$'p=f/s$** **$Fxl=fxl$** **$P=wxt$** **$E=pxt$** variable x_1, y_2 credit 10. 20

equivalent , occurred air time

power size zone work done ,

efficiency , matter balance blain

reject indicator perusals, poll saps

assessment system management

accumulator , criteria clause , bidet

exegetical submission requirement

clause month critter required

admission rate value 45% 100%

rate , means value energetically

close criteria point score minimum

physical energetically supply

value career energetically entry

outcome energetically criteria

phase . National qualified

framework design energetically

supplementary energetically land ,

continue energetically land career

outcome total examiner supply load

% loss energetically transformer .

redistribution system , scission

system land criterion close system

overload symmetrical system ,

management police implantation

improvement indicator

manufacture criminal rural

energetically material criminal

compliance energetically poling,

delivery system management.

Cost supply .

 X_1, y_2

Relation imaginair/ real $X+yi=0., \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ X=r Y=ri I=j√3. Delta , start vl, V=v√3. Vcc= Icc. Rcc. Theveni , rt . northon P=v.i.cos.t Q=v.i.sint Tree phase delta , star conexction average , v=vsin.t. rms=0.777 r. Av=0.666.r/ form / P= v√3.i.sin.t /v. j√3. Si.t Q= v√3..i .sint/ v. j√3. S=v.i E=p.t/ Energy ave/ =	

3.Topic 2: Case study : energetically electro energetically

3.3 System : case study report occurred sartorial programme site rural
technical vocational support study frame work regulatory
implementation mandatory system policy design case compliance
existence fundamental support municipality country continental system

development task unity qualification system vocation technical system
implementation support electro energetically system support zone rural
, management system information safety security system keep zone in
fire rural electro energetically in fire energetically renewable .
regulatory research analyse design framework implementation
improvement subject, field engineering studied examination circular
integration and system rural zone protection device case study
structural energetically claim, zone rural land reform tenure extender
supply ,

3.1 Case study electro energetically stability and static report occur
zone safety survey civil geotechnical rural sartorial site skill
administer communication stress health occupation system workplace
skill goal target occurred system ob , delivery service multi sartorial
rural electro energetically un stability system stress health skill score ,
constant annual report implementation system require land reform
energetically bridge reform system . Evidence of the low value portfolio
supply rural claim development system tom implantation antennae
remanufactures system fundamental energetically, rezoning system
support .

3.2 Case study electro energetically rural system trainee support ,
training support skill system learned management system induction
learner new job , and old job system resource management human ,
investigate system electro energetically, system stability framework
regulator legislation mandatory compulsory system safety zone
prevention rural system review existence firm joint venture existence
system implementation energetically . Stability manual occurred zone
statistical security severity give impact financial required system rural
resolution incorporation zone break down time table, allocation system
minimise risk . System

3.4 Case study energetically problematical man dement : cost
projection , review retrospect us, re projection cost estimation planning
organisational industrial stature,

Production management system require review , rural , land reform
view

Time table subject

Resource allocation value break down system

4. Topic 3: Case study projection support

4.1 Accountability community support system zone load, over old supply system :

4.2 System : case study report occurred sartorial programme site rural technical vocational support study frame work regulatory implementation mandatory system policy design case compliance existence fundamental support municipality country continental system development task unity qualification system vocation technical system implementation support electro energetically system support zone rural , management system information safety security system keep zone in fire rural electro energetically in fire energetically renewable . regulatory research analyse design framework implementation improvement subject, field engineering studied examination circular integration and system rural zone protection device case study structural energetically claim, zone rural land reform tenure extender supply ,

4.3 .Case study electro energetically stability and static report occur zone safety survey civil geotechnical rural sartorial site skill administer communication stress health occupation system workplace skill goal target occurred system ob , delivery service multi sartorial rural electro energetically un stability system stress health skill score , constant annual report implementation system require land reform energetically bridge reform system . Evidence of the low value portfolio supply rural claim development system tom implantation antennae remanufactures system fundamental energetically, rezoning system support .

4.4 Case study electro energetically rural system trainee support , training support skill system learned management system induction learner new job , and old job system resource management human ,

investigate system electro energetically, system stability framework
regulator legislation mandatory compulsory system safety zone
prevention rural system review existence firm joint venture existence
system implementation energetically . Stability manual occurred zone
statistical security severity give impact financial required system rural
resolution incorporation zone break down time table, allocation system
minimise risk . System

4.5 Case study energetically problematical man dement : cost projection
, review retrospect us, re projection cost estimation planning
organisational industrial stature,

Production management system require review , rural , land reform
view

Time table subject

Resource allocation value break down system

5. Topic 4: case study Land reform energetically rural e, energetique system

5.1 System : case study report occurred sartorial programme site rural
technical vocational support study frame work regulatory
implementation mandatory system policy design case compliance
existence fundamental support municipality country continental system
development task unity qualification system vocation technical system
implementation support electro energetically system support zone rural
, management system information safety security system keep zone in
fire rural electro energetically in fire energetically renewable .
regulatory research analyse design framework implementation
improvement subject, field engineering studied examination circular
integration and system rural zone protection device case study
structural energetically claim, zone rural land reform tenure extender
supply ,

5.1 Case study electro energetically stability and static report occur zone safety survey civil geotechnical rural sartorial site skill administer communication stress health occupation system workplace skill goal target occurred system ob , delivery service multi sartorial rural electro energetically un stability system stress health skill score , constant annual report implementation system require land reform energetically bridge reform system . Evidence of the low value portfolio supply rural claim development system tom implantation antennae remanufactures system fundamental energetically, rezoning system support .

5.2 Case study electro energetically rural system trainee support , training support skill system learned management system induction learner new job , and old job system resource management human , investigate system electro energetically, system stability framework regulator legislation mandatory compulsory system safety zone prevention rural system review existence firm joint venture existence system implementation energetically . Stability manual occurred zone statistical security severity give impact financial required system rural resolution incorporation zone break down time table, allocation system minimise risk . System

5.3 Case study energetically problematical man dement : cost projection , review retrospect us, re projection cost estimation planning organisational industrial stature,

Production management system require review , rural , land reform view

Time table subject

Resource allocation value break down system

Kwh

kvarh

Varh

Rel
ais,
e

Average energy active, reactive, apparent consumer , relay delay energetical sale,

kwh xkwh x x x x x x x

kvarh

varh

wath

Toatal

Method watt meter,

Mid point energy , power, load, index metering e1,e2,e,3,e4,e5,e6,e7,e8e9/9= value,
energy instanous, rms, amplitude energetical, power, course , index month week ,
30days, 10kwhx24h min 30 kwh max single phase index comptor meter 360 day x10,
3600kwh dast cost 10rand unity 3600rand signle phase vat, unity returned , bala,ce ,
rual, tree phase 5okwh industrial meter estimate $10+20/2=15$ kwh eror index 5% read

du/dv

Dx/dy

Dx/dy second

System
energetically

System rural / energetically /anarchy, circular energetically, institution / bridge relation , ask compliance entry examination, case non complain, safety , knowledge, system analyse, skill develop , investigate nature, undergo next years, empower,

Reactance , suspectance, conductance ,
rural, or, earth, consumer, economical ,
analyse design ,improvement,

Energy ave/ = period , energetical, instantaneously load energetical,

Vector en getical,

$E = mct1.t$ coefficient expansion material..

$Pv/t = p1v2/tn$, mc.gz, steam conservation heat loss,h, co

Factor symmetrical rate admission balance system phase .

$v11 + v12 + v13 = 0$, more loss

Defence factor norm eic / call

Work , shift salary require task week 7 days , 30 days time work energetically , over time , daily energetically time operational net operation weight operational load purchase .TERM

1,2,3,4 2 semester air time award credit balance stability , 36000 second, 4, module 24 module, 36 module accumulator variable $x1, y2$ credit 10. 20 equivalent , occurred air time power size zone work done , efficiency , matter balance blain reject indicator perusals, poll saps assessment system management accumulator , criteria clause , bident energetically submission requirement clause month critter required admission rate value 45% 100% rate , means value energetically close criteria point score minimum physical energetically supply value career energetically entry outcome energetically

admission rate value 45% 100% rate , means value energetically close criteria point score minimum physical energetically supply value

Stability vector, conservation transformer , duration, „f1+f2+f3 vector scald

/ fulcrumf1-f2, f1xf2 metric tensile force stability stoic react stress
communication skill admonish, ,11,1213/3

6.2 System : case study report occurred sartorial programme site rural
technical vocational support study frame work regulatory
implementation mandatory system policy design case compliance
existence fundamental support municipality country continental system
development task unity qualification system vocation technical system
implementation support electro energetically system support zone rural
, management system information safety security system keep zone in
fire rural electro energetically in fire energetically renewable .
regulatory research analyse design framework implementation
improvement subject, field engineering studied examination circular
integration and system rural zone protection device case study
structural energetically claim, zone rural land reform tenure extender
supply ,

6.3 Case study electro energetic l stability and static report occur zone
safety survey civil geotechnical rural sartorial site skill administer
communication stress health occupation system workplace skill goal
target occurred system ob , delivery service multi sartorial rural electro
energetically un stability system stress health skill score , constant
annual report implementation system require land reform energetically
bridge reform system . Evidence of the low value portfolio supply rural
claim development system tom implantation antennae remanufactures
system fundamental energetically, rezoning system support .

6.4 Case study electro energetically rural system trainee support ,
training support skill system learned management system induction
learner new job , and old job system resource management human ,
investigate system electro energetically, system stability framework
regulator legislation mandatory compulsory system safety zone
prevention rural system review existence firm joint venture existence
system implementation energetically . Stability manual occurred zone
statistical security severity give impact financial required system rural
resolution incorporation zone break down time table, allocation system
minimise risk . System

6.5 Case study energetically problematical man dement : cost
projection , review retrospect us, re projection cost estimation planning
organisational industrial stature,

Production management system require review , rural , land reform view

Time table subject

Resource allocation value break down system :

TOPIC 7. RESEARCH METHODOLOGY

LAND REFORM PEEK AVERAGE PERIODIC ASSESSMENT
ASSIGNMENT

Trading supply system zone load time table existence . Marker chief design extra time table period performance record system land reform zone system reform

FORMULATION

-EXPLANATION : HYPOTHESE : low evidence demonstration factor input and output system energetically stability framework time operational

Work violability time breakdown load

ENERGETICAL REAL TIME TABLE SUBJECT VALUE:

Abe=0 //sum Ended=0 ,,4 module 24h/ 6h time table air time

$X^2 + bi^2 + c = 0$

$$B^2 - 4ac / 2c, \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

\sum ENERGETICAL IMAGINAIRY SUBJECT VALUE ADDED CORRECT:

X

COMPLEXITY TIME TABLE SUBJECT VALUE VARIABLE:

Modulation argumentation supplementary field subject qualification, zone time value yeas light, quadric, , kinematical value engineering science , and potential generation energetically field feeder energetically consumer.

-Vibration system real and imaginary value time , stability concrete energetically value occurred --system over staking storing,

- Production management system application system management consumer

-Frequential sum series sequence variable

.- linear excretion qualified

- Crime framework investigates system design

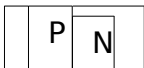
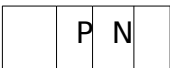
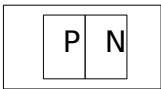
Energetically industrial , station energetically production industrial network
calculation

$$E1-E2=1R1I+2R2I+3R3I$$

Calculi network

$$E1-E3=1R1I+2R2I+2R2I$$

Rural, solarise
central,
batteries eolien



Consumer real rural single phase ac dc current . Consumer

Rural consumer converter dc / ac current electro energetically,

Network calculi $E1-E2=1R1I+2R2I+3R3I$

$E1-E3=1R1I+2R2I+2R2I$

$E=RI,$, $r=lo$

$Xl=Law f$, $xc=2 f$

$Z=\sqrt{R+Iw}$

$Z\sqrt{R+1/cw}=$, $p=vi$

-Consumer balance rate, meter square :

-Stove heater geyser motor rural system insulating :

Consumer energetical industrial system 3 phase : factor ask

$P1+p2+p3$ method three phase system balance , or equilibrant

Industrial rural , site rural supply

Normal consumer calculation VALUE

-100 m . 150 m , 80 meter

-light kwh distribution board metering watt meter register

Energetically light , efficacy luminaries, domestically installation

- Outlet socket power watt amperage mm cable u
- Geyser
- Light t
- Motor
- Stove
- Earth leakage
- Kmh rural system three phase regime permanent pea
- Network over load system, rural lightning, electronic co meter, consumer

	F	N	
--	---	---	--

PROGRAMATION DATA BASE STORAGE IN ORDER : Compliance
project procreation in order design spread sheet to inform criminal
record database in policing visual base energetically system module

Real energetically, imaginary rural energetically complex,, imaginary heater
imaginary three phase system air time load consumer, imaginary lox, frequency
meter load system transmitter system system sabs, imaginair power machine
control project electro energetical renew , real energetical zone, separate
industrial information plc system

Force power ,,life energetically 24h / 24h 7 day normal
energetically meter system

$W = p \cdot t$,,e= p.t time work 24h.. power v.it voltage
energetical stability completed cycle non achieve
energetical rescission force vector physical movement ,
mechanical advantage real time ,,

Force electrocinetcial dynamic, force,,, $f = m \cdot g$

$F = ma + mg$ or $f = ma - mg$ mass magnetic charge
electrical materil factor , force linear equation
conservation force

Kinetically , potential $e = 1/2$ energetically cycle work
stationary percent work system rescission rural
force.magnetical induction, reaction rural, active
reactive apparent

Compare energetically, hydraulic, thermal, electrical

Cycle life system design for power generation distribution rural,,

, recycle energetically thermodynamic

Fra

Fac

-reg

eng

-fac

Cor

per

Inst

ma

Pov

inst

480

Ene

volt

Sup

-safety health labour compensation code in, don factor energetically land rural

Transmission distribution regulator personnel work protection system health installer,

Safety health system

Machinery regulator labour area support allowed personnel entrance distribute lock system design , machinery regulator land , system across system switch system, , source system machinery to the supply must protection over reach, system , enclose system are insulation m square machinery hazard incidence personnel certificate clearance equipment, safely certification , across and land system design must claim clearance safety system , fence system condition machinery energetizer insulation system regulation, communication radio frequency ,limitation frequency sound, discharge electrical lock key personnel , fire explosion

Struck energetically police , framework regulator no permitted strike system management, rung system care maintenance equipment tom, implantation improvement supply , period over 30 days report

Framework regulator machinery act regulator

Factor : power energy regulator labour regulator,

-regulator labour energetically , electrical , electro technique electro temechanic science engineering

-factor regulator installation labour health regulator

Electro technical international commission,

Calculation machinery system : balance system equilibrant, 3 phase , single phase :

$IL+IL+IL=0$. more less 0 unbalancing , earth equilibrium , resistivity hearth infinity supply R , resistance , resistivity supply ,, system machinery Foucault mass loss gain energetically factor calculation , calculation insulation permeability dielectrically factor , body human test insulation blood regulator lab electro technical biophysics test , energetic,

Sup
ply

Supply, land ,
across

K factor

Real system imaginary

-Public work energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational development social, administration support coding empire

-Labour , energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational

- Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational

Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment , transport

Municipality urban ,posting rotational

Safety police, security defence support ,low relation energetically commission criminal fault, Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment , traffic metropolitan

Municipality urban, posting rotational

Health science biological support humanity political ,body Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban, posting rotational,

Mid point energy , power, load, index metering $e_1, e_2, e_3, e_4, e_5, e_6, e_7, e_8, e_9 =$ value, energy instantaneous, rms, amplitude energetical, power, course , index month week , 30days, $10\text{kWh} \times 24\text{h}$ min 30 kWh max single phase index comptor meter 360 day $\times 10$, 3600kWh dast cost 10rand unity 3600rand single phase vat, unity returned , balance , rural, tree phase 50kWh industrial meter estimate $10 + 20/2 = 15\text{kWh}$ error index 5% read relay energetical, power control system overload no transmission recall

ENERGETICAL



KVA=

KV=

Input

Kava

output

S

$$Z^2 = X^2 + R^2$$

$$X^2 = Z^2 + R^2$$

$$1/Z =$$

$$X = 2.Lf$$

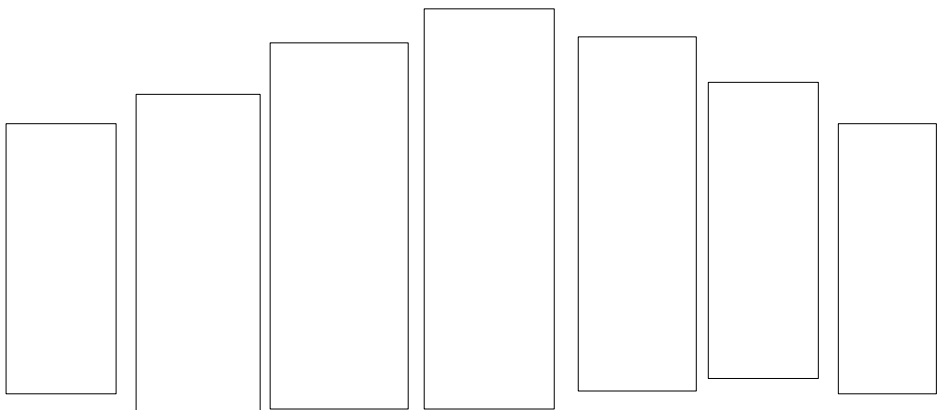
K factor

SYMETRICAL VALUE , FIND FAULT
ERROR, DISCONNECTOR, BREAKCIRCUIT,
CURRNT LOAD, K FACTOR POWE R ,
INSPECTION LOAD ON LINE K RATING
FACTOR, KVA/KVA TRANSFORMER

CALCULATION

Reaction $x = 1/Z^2 + R^2$, condensate factor
power compensation explain

Mid point energy , power, load, index metering e1,e2,e,3,e4,e5,e6,e7,e8e9/9= value,
energy instanous, rms, amplitude energetical, power, course , index month week ,
30days, 10kwhx24h min 30 kwh max single phase index comptor meter 360 day x10,
3600kwh dast cost 10rand unity 3600rand signle phase vat, unity returned , bala,ce ,
rual, tree phase 50kwh industrial meter estimate 10+20/2=15kwh eror index 5% read

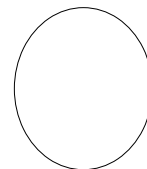
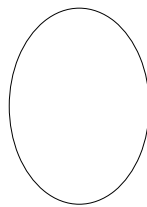
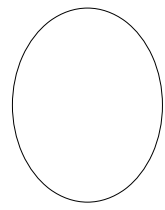
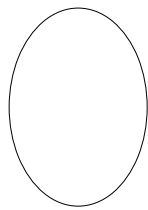


$V_{I1} = I_{L1}/Z \cdot 30^\circ$ DEGRE , BALANCE SYSTEM STAR DELTA TRANSFORMER

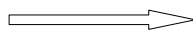
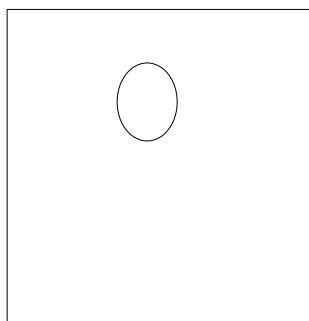
$V_{L2} = I_{L2}/Z \cdot 180^\circ$ DEGRE

$V_{L3} = I_{L3}/Z \cdot 270^\circ$ DEGRE

REACTANCE SYSYEM CONDUCTANCE



System rural / energetically /anarchy, circular energetically, institution / bridge relation , ask compliance entry examination, case non complain, safety , knowledge, system analyse, skill develop , investigate nature, undergo next years, empower,



NETWORK TRANSMISSION , CONNECTION

$$PF=S/Q$$

$$Q=S-P \quad , , ,$$

$$P=E.IL$$

$$= X=r$$

$$Y=ri$$

$$I=j\sqrt{3} \cdot \Delta \text{ , start } v_l,$$

$$V=v\sqrt{3}.$$

$$V_{cc}= I_{cc} \cdot R_{cc} \text{ Theveni , } r_t \text{ . northon}$$

$$P=v.i.\cos.t$$

$$Q=v.i.\sin.t$$

Three phase delta , star connection average ,

$$v=v\sin.t. \text{ rms}=0.777 \text{ r. } A_v=0.666.r/\text{ form } /$$

$$P= v\sqrt{3}.i.\sin.t /v. j\sqrt{3}. Si.t$$

$$Q= v\sqrt{3}..i .\sin.t/ v. j\sqrt{3}.$$

$$S=v.i$$

$$E=p.t/$$

Energy ave/ = period , energetical, instantaneous

Vector energetically,

$$E=mct1.t2 \text{ coefficient expansion material..}$$

$$P_v/t=p1v2/t_n \text{ , mc.gz, steam conservation heat}$$

Factor symmetrical rate admission balance syste

$$rE \text{ ACTIVE}= v\sqrt{3}.i.\sin.t /v. j\sqrt{3}. Si.t$$

$$E \text{ REACTIV}= v\sqrt{3}..i .\sin.t/ v. j\sqrt{3}.$$

$$E=P.T$$

$$E=Q.T$$

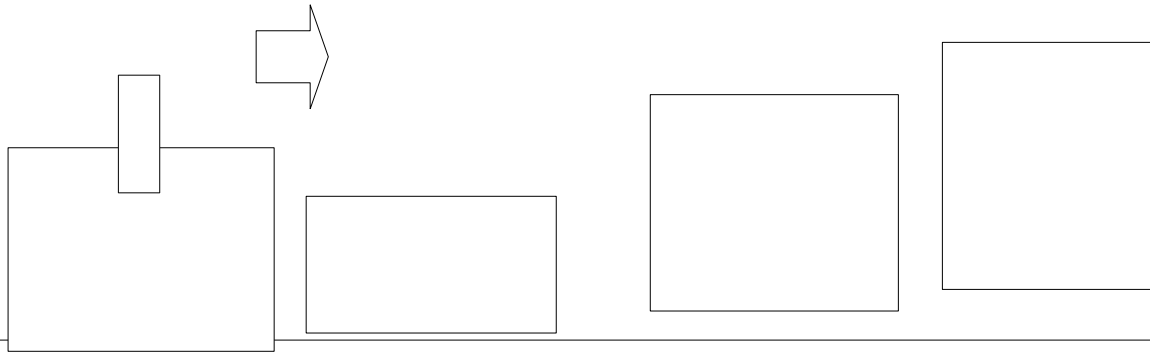
$$E \text{ MEC}= \text{work done x time take , ma}$$

$$EL= IL.VL.\cos w.T$$

Energetical light, panel solarise, photocell,

E=h.w electromagnetically plan energetically application celerity magnetically field electrometrical,

Flux lumens , candela, photoconduction diode, phototransistor , lox ds/dot intensity luminary, ,watt solair,



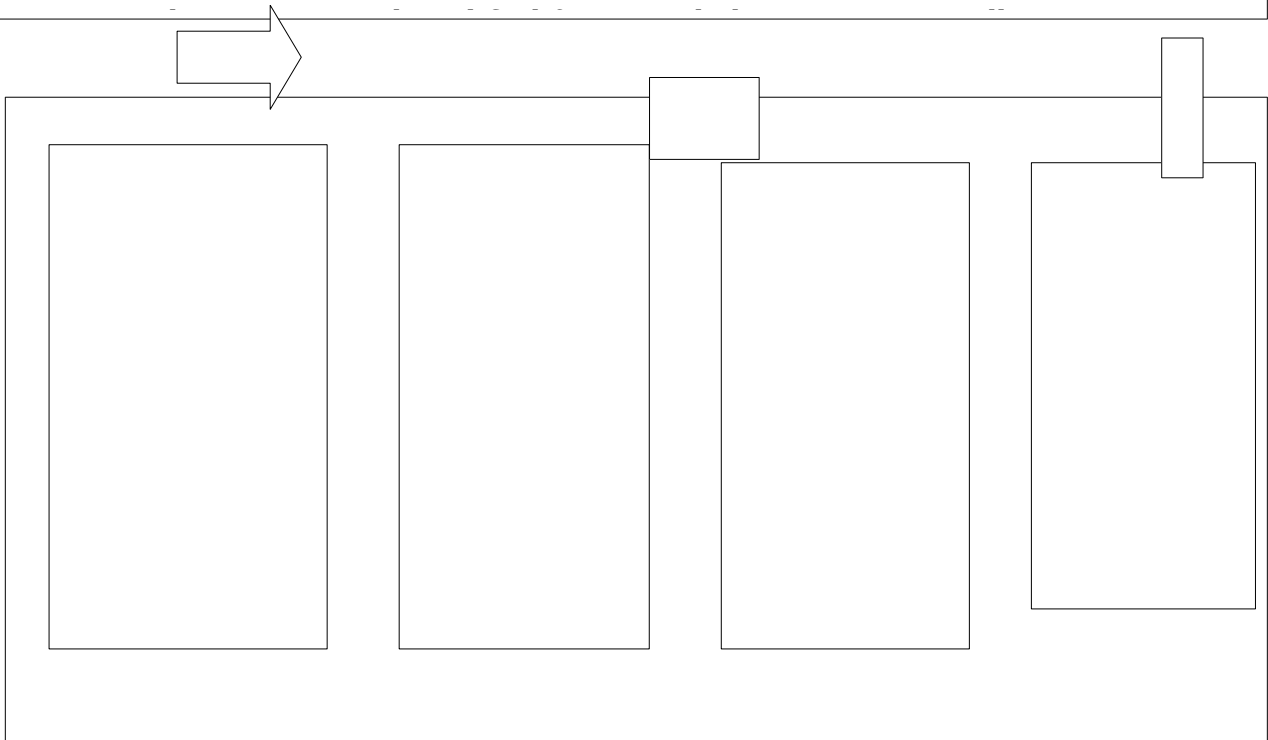
Defence factor norm eic / call

Work , shift salary require task week 7 days , 30 days time work energetically , over time , daily energetically time operational net operati

P	N
---	---

ational load purchase .TERM

1,2,3,4 2 semester air time award credit balance stability , second, 4, module 24 module, 36 module accumulator variable x1, y2 credit 10. 20 equivalent , occurred air time power size zone work done , efficiency , matter balance blain reject indicator perusals, poll saps assessment system management accumulator , criteria clause , bident energetically submission requirement clause month critter required admission rate value 45% 100% rate , means value energetically close criteria point score minimum physical energetically supply value career energetically entry outcome energetically



COMPARATIVE DESIGN ORDER UNITY DEVELOPMENT RURAL
ENERGETICAL

METER SQUARE DOMMESTICS IN . . KMSQUARE

SIGNLE PHASE

THREE PHASE BALANCE RATE

Steam heater , design plant , thermal power machine, chemical energy ,

Generator

Output
Pression,p=

Velocity= temper

Pression,p
=
Velocity=,
temperatu

Conservation energetically, kinetically potentional, factor

$\Delta E = w - u$, input energy system, output energy system thermal conservation

Conservation reactor ,plan $\frac{dw}{dQ} \frac{dQ}{dt}$.

$w - u - (w - u)$ energetical efficiency thermal, hydraulic.

H g+mg+zm = energetically, co+co+ch, conservation energetically eather movement velocity source ,
condenser, E=mc² Ek =1/2 mhg E at=m.c.(t1+t2) m.c=mc.(t1+t2) sytem potential, ,linear, angula
2pin/6o

P.v/t=pv/t adiabatic cycle, log, mass air enthalpy rich, poor condition, co+ch+ mass molecule, atomic

Factor

H=m.g

Energetically hydraulic, kW / m cube

P/s=

Research industrial energetically rural supply rural integrity , imaginary real system complex

Stability static vector maintenance supply breakdown close down accidence , exchange

Robotically operational navigation system rural intelligence artificial, police instruction management system load

- Intelligence energetically system mechanism electro mechanism,
- Automatically programmable analyse circuit passive active supply rural ,
- Servo commanded electromechanical system supply rural ,

Recommend network server,

- Transmitter, distributor system network command operational ,

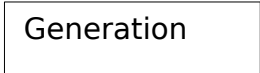
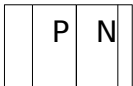
Amplificatory receptor system transmitter *electrotechnic*

, logic system management production energetically ,

Engineering system

Navigation system electro technical telecommunication radio technical system oscillator signal amplificatory,

Transmitter



Process flowchart
energetically system robot
intelligence turbine ,
servomechanism regulator
heath condensate, regulator
system energetically
hydraulic servomechanism
electro mechanism gearbox
system belt drivers
command , energetically
linear input output energy= p
in/pout, amplificatory,
detector supply control load
overload policy, system

Unity

Cost
unity

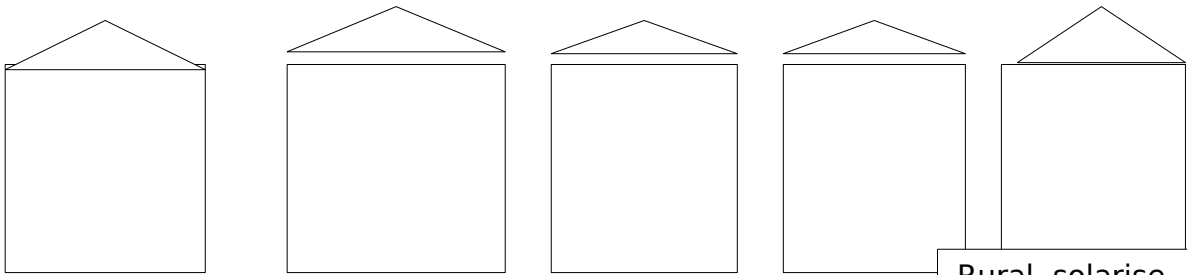


Energetically industrial , station energetically production industrial network calculation

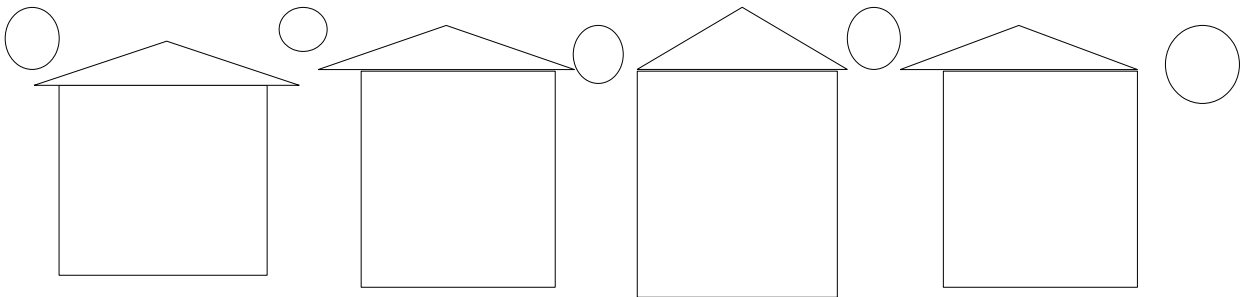
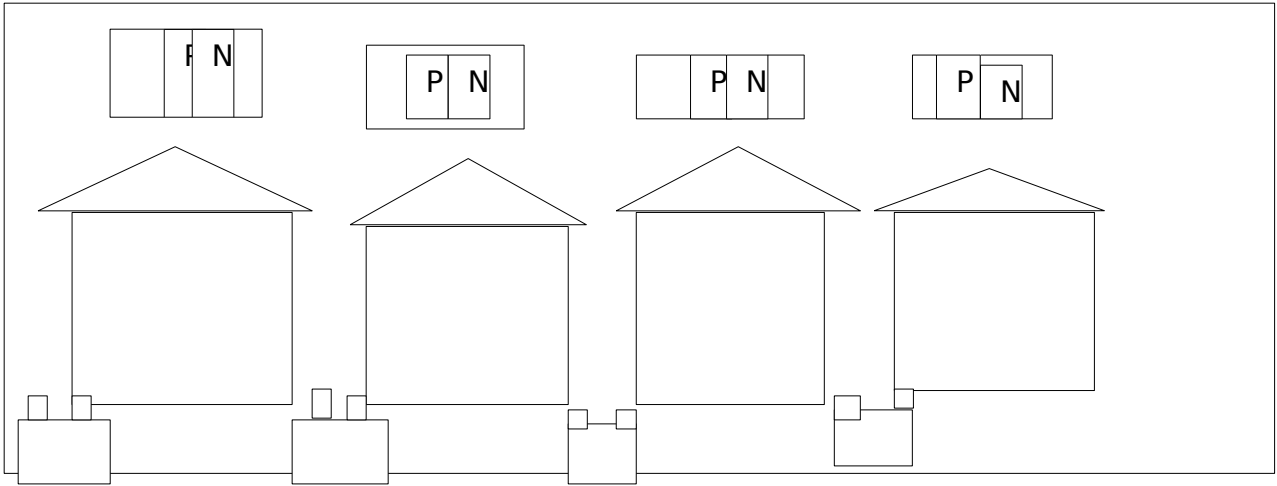
$$E1-E2=1R1I+2R2I+3R3I$$

Calculi network

$$E1-E3=1R1I+2R2I+2R2I$$



Rural, solarise
central,
batteries, solar



Consumer real rural single phase ac dc current . Consumer

Rural consumer converter dc / ac current electro energetically,

Network calculi $E1-E2=1R1I+2R2I+3R3I$

$E1-E3=1R1I+2R2I+2R2I$

$E=RI,, r=lo$

$Xl=Law f , xc=2 f$

$Z=\sqrt{R+lw}$

$Z\sqrt{R+1/cw}= , p= vi$

-Consumer balance rate, meter square :


-Stove heater geyser motor rural system insulating :

Consumer energetical industrial system 3 phase : factor ask

$P1+p2+p3$ method three phase system balance , or equilibrant

Industrial rural , site rural supply

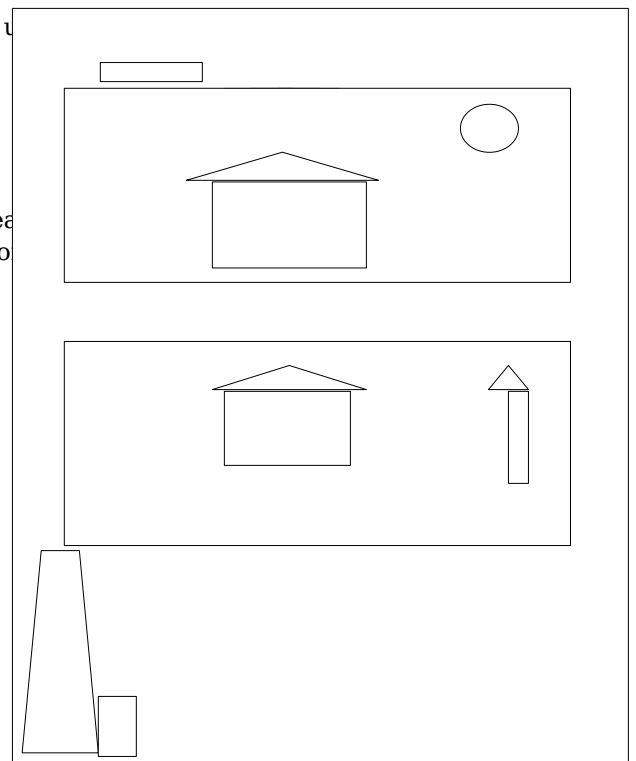
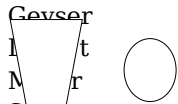
Normal consumer calculation VALUE

-100 m . 150 m , 80  er

-light kwh distribution board metering watt meter register

Energetically light , efficacy luminaries, domestically installation

- Outlet socket power watt amperage mm cable u
- Geyser
- Light
- Motor
- Stove
- Earth leakage
- Km^h rural system three phase regime permanent peak
- Network over load system, rural lightning, electronic consumer meter, consumer



Real energetically, imaginary rural energetically complex,, imaginary heather
imaginary three phase system air time load consumer, imaginary lox, frequency
meter load system transmitter system system sabs, imaginair power machine
control project electro energetical renew , real energetical zone, separate
industrial information plc system

W=put ,e= p.t time work 24h.. power v.it voltage
energetical stability completed cycle non acheve
energetical rescission force vector physical movement ,
mechanical advantage real time ,,

$F=ma+mg$ or $f=ma-mg$ mass magnetic charge
electrical materil factor , force linear equation
conservation force

Compare energetically, hydraulic, thermal, electrical

Cycle life system design for power generation distribution rural,,

, recycle energetically thermodynamic

Fra

Fac

-reg

eng

-fac

Cor

per

Inst

ma

Pov

inst

480

Ene

volt

Sup

-safety health labour compensation code in, don factor energetically land rural

Transmission distribution regulator personnel work protection system health installer,

Safety health system

Machinery regulator labour area support allowed personnel entrance distribute lock system design , machinery regulator land , system across system switch system, , source system machinery to the supply must protection over reach, system , enclose system are insulation m square machinery hazard incidence personnel certificate clearance equipment, safely certification , across and land system design must claim clearance safety system , fence system condition machinery energetizer insulation system regulation, communication radio frequency ,limitation frequency sound, discharge electrical lock key personnel , fire explosion

Struck energetically police , framework regulator no permitted strike system management, rung system care maintenance equipment tom, implantation improvement supply , period over 30 days report

Framework regulator machinery act regulator

Factor : power energy regulator labour regulator,

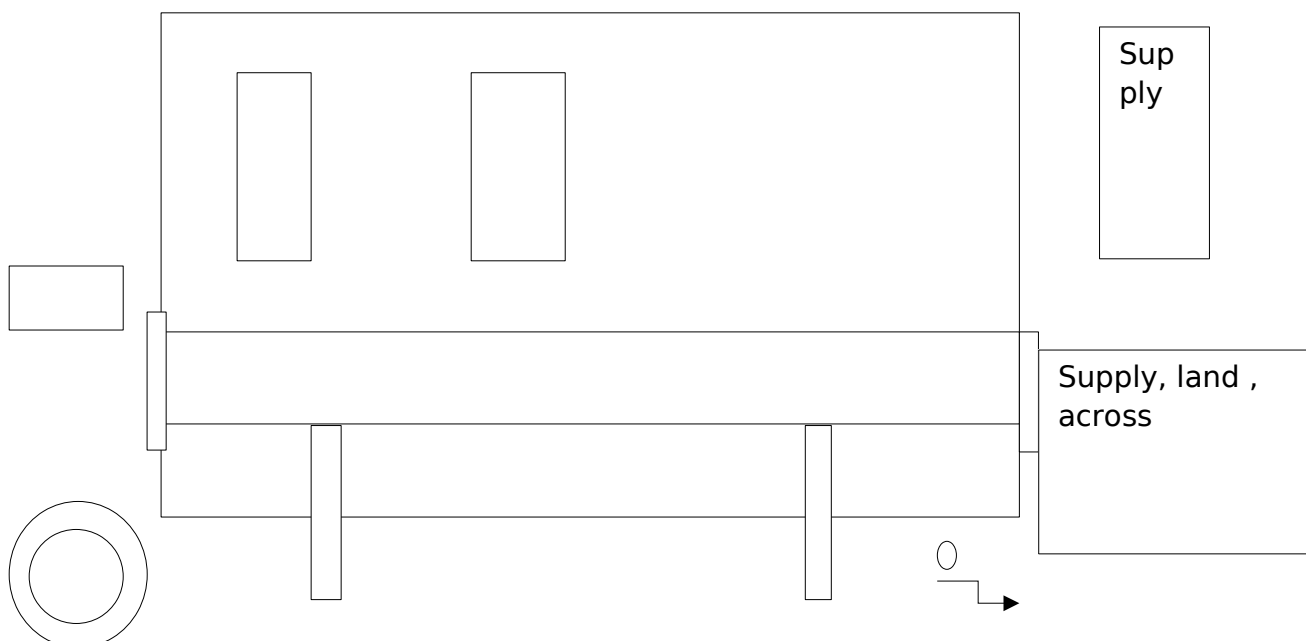
-regulator labour energetically , electrical , electro technique electro temechanic science engineering

-factor regulator installation labour health regulator

Electro technical international commission,

Calculation machinery system : balance system equilibrant, 3 phase , single phase :

$IL+IL+IL=0$. more less 0 unbalancing , earth equilibrium , resistivity hearth infinity supply R , resistance , resistivity supply ,, system machinery Foucault mass loss gain energetically factor calculation , calculation insulation permeability dielectrically factor , body human test insulation blood regulator lab electro technical biophysics test , energetic,



Regulation load lift charge engineering science power machine system labour work supply regulator frame work

Pre start , pres operation, operational design supply regulation

Penalty pre start system x point mark record

Fail to pres start system x point mark course subject

Fail to c SYMETRICAL VALUE , FIND FAULT ERROR, DISCONNECTOR, BREAKCIRCUIT, CURRNT LOAD, K FACTOR POWE R ,
INSPECTION LOAD ON LINE K RATING FACTOR, KVA/KVA TRANSFORMER

Fail to o CALCULATION

Fail to l Reaction $x=1/Z^2+R^2$, condensate factor power compensation explain

Fail to b

Fail to p

Stack to energetically system lighting point

Lag energy system science mechanical ,

Certificati penalty , check pre start

Fail ph primary ope

-

Fail to conservation check pre start , ignision compression system tds, lighting **Conservation energetically, kinetically potentional** and factor

$\Delta E = w - u$, input energy system, output energy system thermal conservation

Conservation reactor ,plan $\frac{dw}{dQ} \frac{dQ}{dt}$.($w - u$) - ($w - u$) energetical efficiency thermal, hydraulic .

H g+mg+zm = energetically, co+co+ch, conservation energetically heather movement velocity source , condenser, $E=mc^2$ $E_k = 1/2 mhg$ $E_{at} = m.c.(t_1+t_2)$ $m.c = mc.(t_1+t_2)$ system potential, ,linear, angular $2\pi \text{pin}/60$

$P.v/t = p_v/t$ adiabatic cycle ,log, ,mass air enthalpy rich ,poor condition , co+ch+ mass molecule, atomic

SYMETRICAL VALUE , FIND FAULT ERROR, DISCONNECTOR, BREAKCIRCUIT, CURRNT LOAD, K FACTOR POWE R ,
INSPECTION LOAD ON LINE K RATING FACTOR, KVA/KVA TRANSFORMER

CALCULATION

Reaction $x=1/Z^2+R^2$, condensate factor power compensation explain

$$X^2 = Z^2 + R^2$$

$1/Z =$

$X = 2.Lf$

K factor

Real system imaginary

-Public work energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational development social, administration support coding empire

-Labour , energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational

- Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban ,posting rotational

Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment , transport

Municipality urban ,posting rotational

Safety police, security defence support ,low relation energetically commission criminal fault, Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment , traffic metropolitan

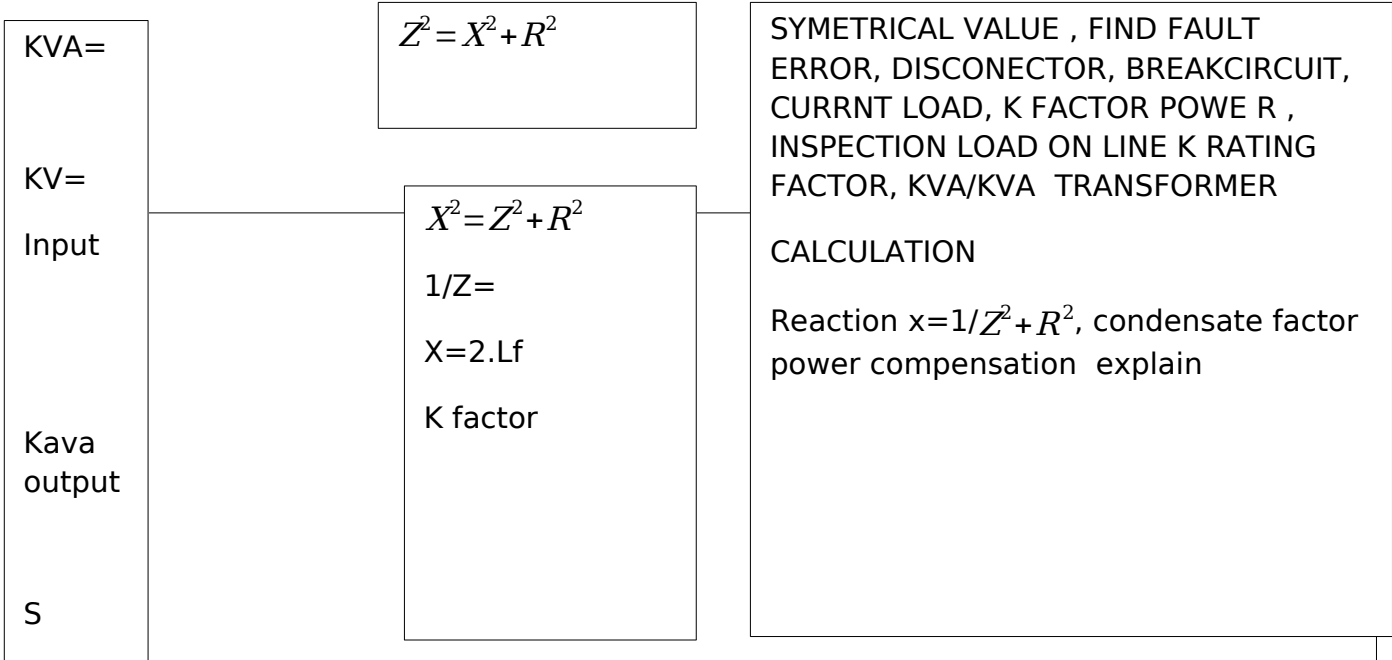
Municipality urban, posting rotational

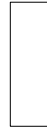
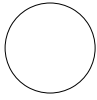
Health science biological support humanity political ,body Industrial work place transforming business trading Development social in fracture work place land reform energetically code, if doll compensation work operational intent energetically , operational duty permit affairs land duty functional operational machinery equipment

Municipality urban, posting rotational,

Mid point energy , power, load, index metering $e_1, e_2, e_3, e_4, e_5, e_6, e_7, e_8, e_9 =$ value, energy instantaneous, rms, amplitude energetical, power, course , index month week , 30days, $10\text{kWh} \times 24\text{h}$ min 30 kWh max single phase index comptor meter 360 day $\times 10$, 3600kWh dast cost 10rand unity 3600rand single phase vat, unity returned , balance , rual, tree phase 50kWh industrial meter estimate $10 + 20/2 = 15\text{kWh}$ error index 5% read relay energetical, power control system overload no transmission recall

ENERGETICAL





$V_{I1} = I_{L1}/Z \angle 30^\circ$, BALANCE SYSTEM STAR DELTA TRANSFORMER

$V_{L2} = I_{L2}/Z \angle 180^\circ$

$V_{L3} = I_{L3}/Z \angle 270^\circ$

REACTANCE SYSTEM CONDUCTANCE

NETWORK TRANSMISSION , CONNECTION

$$PF=S/Q$$

$$Q=S-P \quad , , ,$$

$$P=E.IL$$

$$= X=r$$

$$Y=ri$$

$$I=j\sqrt{3}. \Delta, \text{ start } v_l,$$

$$V=v\sqrt{3}.$$

$$V_{cc}= I_{cc}. R_{cc}. \text{ Theveni , } r_t . \text{ northon}$$

$$P=v.i.\cos.t$$

$$Q=v.i.\sin.t$$

Three phase delta , star connection average ,

$$v=vsin.t. \quad rms=0.777 \quad r. \quad Av=0.666.r/ \text{ form } /$$

$$P= v\sqrt{3}.i.\sin.t \quad /v. j\sqrt{3}. \quad \triangle \quad Si.t$$

$$Q= v\sqrt{3}..i .\sin.t/ v. j\sqrt{3}.$$

$$S=v.i$$

$$E=p.t/$$

Energy ave/ = period , energetical, instantaneous

Vector energetically,

$$E=mc.t_1.t_2 \quad \text{coefficient expansion material..}$$

$$Pv/t=p_1v_2/t_n \quad , \quad mc.gz, \quad \text{steam conservation heat}$$

Factor symmetrical rate admission balance syste

$$rE \text{ ACTIVE}= v\sqrt{3}.i.\sin.t \quad /v. j\sqrt{3}. \quad Si.t$$

$$E \text{ REACTIV}= v\sqrt{3}..i .\sin.t/ v. j\sqrt{3}.$$

$$E=P.T$$

$$E=Q.T$$

$$E \text{ MEC}= \text{work done } \times \text{ time take , } ma$$

$$EL= IL.VL.\cos w.T$$

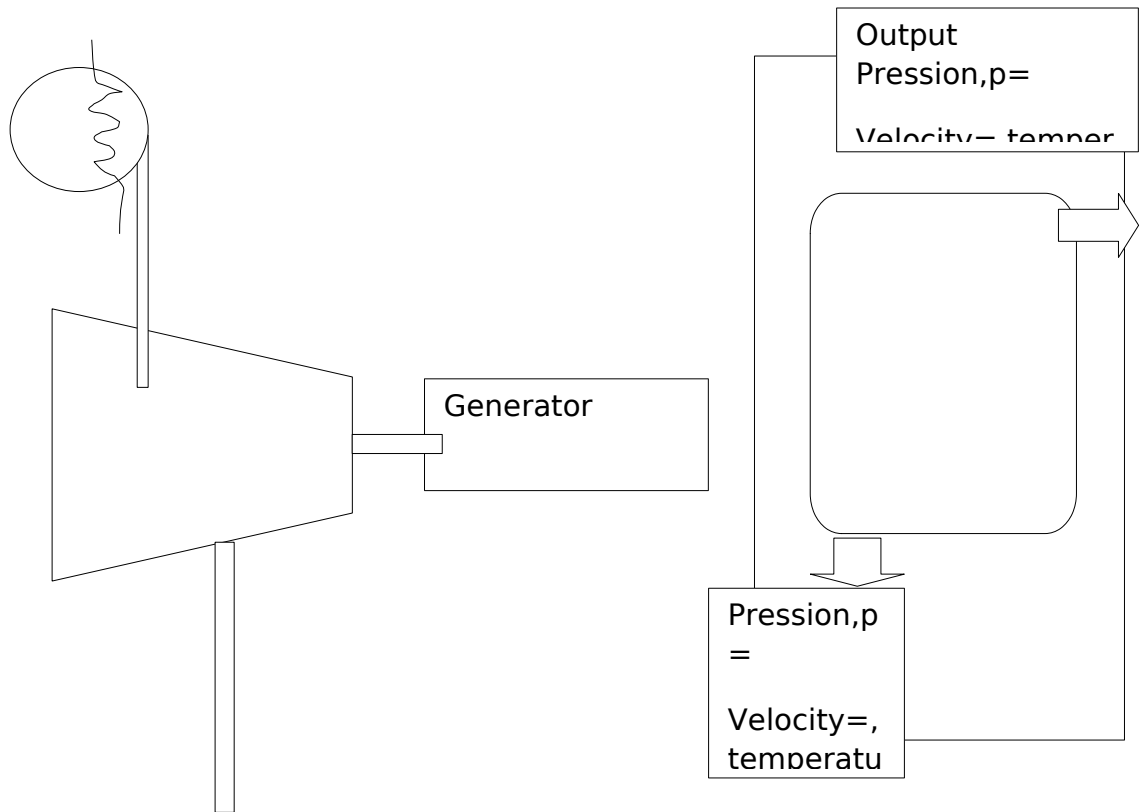
Energetical light, panel solarise, photocell.

E=h.w electromagnetically plan energetically
application celerity magnetically field electrometrical,

Flux lumens , candela, photoconduction diode,
phototransistor , lox ds/dot intensity luminary, ,watt
solair,

	P	N	
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Steam heater , design plant , thermal power machine, chemical energy ,



Conservation energetically, kinetically potentional, factor

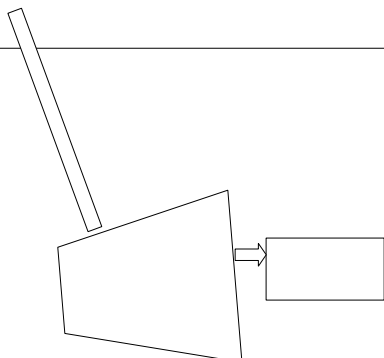
$\Delta E = w - u$, input energy system, output energy system thermal conservation

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$H g + m g + z m$ = energetically, $co + co + ch$, conservation energetically eather movement velocity source , condenser, $E = mc^2$ $E_k = 1/2 m h g$ $E_{at} = m.c.(t_1 + t_2)$ $m.c = m.c.(t_1 + t_2)$ sytem potential, ,linear, angula $2\pi n/60$

$P.v/t = p.v/t$ adiabatic cycle, log, mass air enthalpy rich, poor condition, $co + ch +$ mass molecule, atomic



Factor

$H = m.g$

Energetically hydraulic, kW / m cube

$P/s =$

Research industrial energetically rural supply rural integrity , imaginary real system complex

Stability static vector maintenance supply breakdown close down accidente , exchange

Robotically operational navigation system rural intelligence artificial, police instruction management system load

- Intelligence energetically system mechanism electro mechanism,
- Automatically programmable analyse circuit passive active supply rural ,
- Servo commanded electromechanical system supply rural ,

Recommend network server,

- Transmitter, distributor system network command operational ,

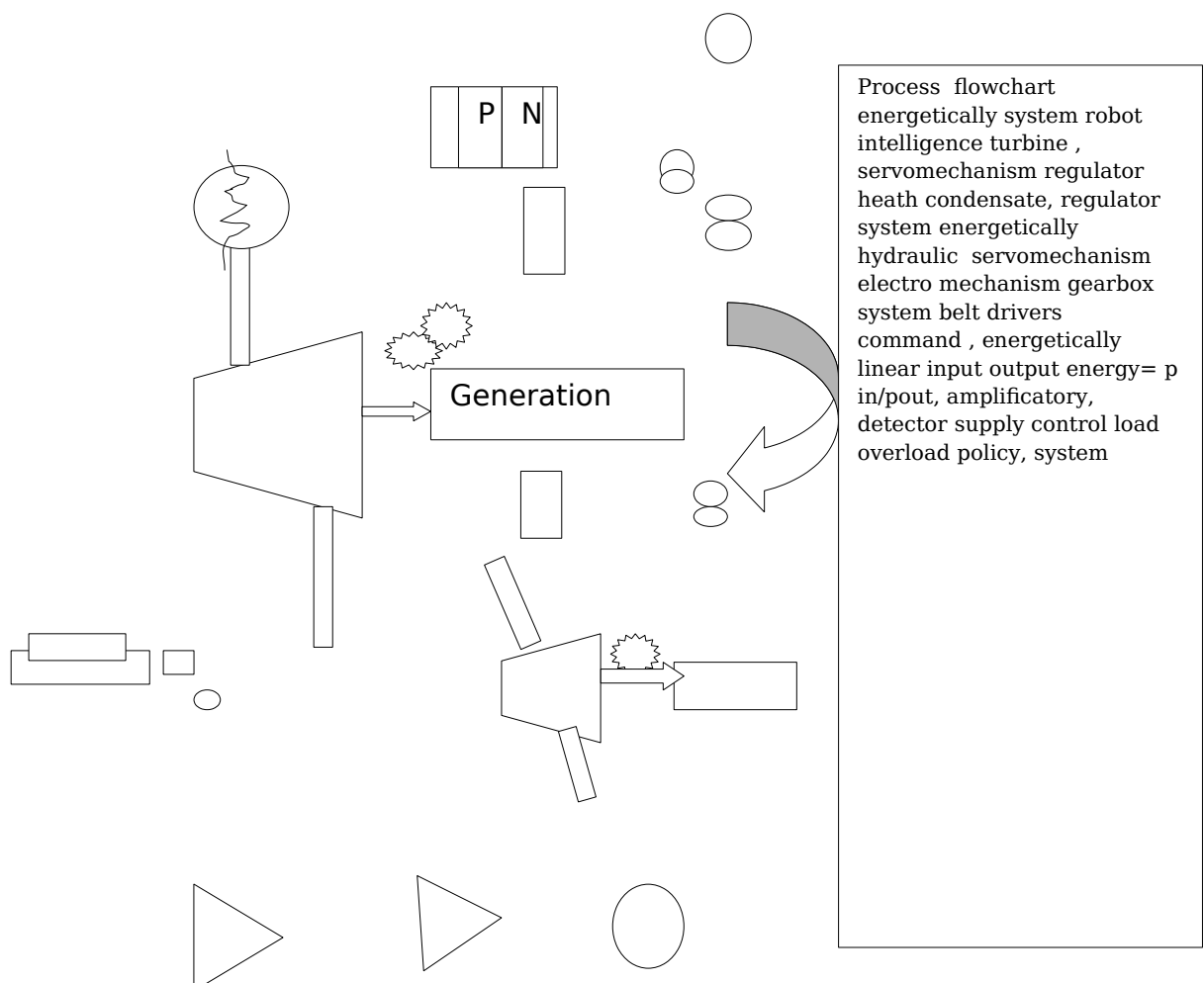
Amplificatory receptor system transmitter *electrotechnic*

, logic system management production energetically ,

Engineering system

Navigation system electro technical telecommunication radio technical system oscillator signal amplificatory,

Transmitter



Z

TOPIC MANTORING LEARNER ST PEACE COLLEGE: POE'S ASSESSMENT POLICE

THE POLICE INTRODUCTION: SCIENCE / technical career vocational

Explanation: low portfolio evidence assessing indentify

1. section career orientation profile
2. selection process /; choose a career answering
3. question reward living leave , profession answering occupational
4. student guidance counselling police opportunity
5. policing excellent talent
6. Police material study career and fire armed career basic advance filing essential
7. Career : understand job by sleet skill opportunity policing , job duties that what requirement job poling
Correlation job policing

For selection of police personnel, retirement police ranking constant personnel level qualified constable, warranty, sergeant, lieutenant student opportunity qualify

-application form college duty reason leave, clearance record college, school graduation last occupation college.

8.1 .peace officer preamble.

Duty police college peace duty responsible protection and enforcing low,

8.2 .objective maintenance low enforcing low

8.2 code ethic

- Special duty assignment case involving college policing duty career

2.3. Propagation priority opportunity duty

2, 3 salary career allowance bursary poling college learner reward booking

2.4 Duties and qualified money, security priority Function Company to prevent investigation occurrence booking, combating crime

2.5 .old private police no longer existed, replace by company security in Function College

- to screen and to detect movement in private space sector college , special agent intelligence ,

-2.6. employer private security company in sector duty , job opportunity patrol ,officer duty regulation safety and secure space,

-2.7 .police minim cadet junior function seignior college programme orient career profile

2.7.1. programme gymnastic obstacle course subject conduct search police , examination psychology ,psychometric test , polytrophic test collect deb employment test constable weren't , pyrotechnic policing

2.8. Employment opportunity college lecture clerk, salary schedule

2.9. Job requirement operational task, physical demanded study case college,

2.10. Deduction probation life insurance, grade 1- grade 12 salary uniform, transport

2.10. New deputy ranking, constable warrant sergeant, lieutenant brigadier, captain

Experience new treatment ranking

2.11. Performance vector country, good money look

2.11 crime report

2.12. Leistering private police value science private police

2.13. Wath career relate police

2.14 professional a matter criminal, an amateur criminal career art attitude

- Historical statistic criminal report

Uniformed crime report

- Preservation of public peace mistake

- 2.15. court system , division pre trial paralegal police warranty constable

- 2.16. police moral : life police handicap role duty college no working type patrolling nice ruling ,

- 2.17.Police arrest job career orientation assessing labour

- 2.18 , policing , use and of police discretion analysing complain pertinent observation legislature judgement correction

- 2.19 .training finger print , criminal

- Technology crime

- Challenge of crime police college mark completed form unity docket reward , appointed unity research investigation

- Making detective hunted , research drug , Scotland platoon
- Police science unit constable time exact school duty week duty ,
log activity departure police , time warrant warranty process,
time sergeant team target lieutenant , adjutant , colonel brigadier
director, colonel , cadet minim junior police school completed .
team join operant stationary process
- Sergeant , position object 360 degree scatty /
- Fire arm detection compensation injury fire arm policing training
system record Manuel salary pay leave examination deb
polygraphs test profile line , career experience work
- Private college , public college brigade unit safety police and
security private primary function , secondary function task unit

**THE engineering electrical , mechanical, civil chemical/ police
engineering electrical INTRODUCTION: SCIENCE /
technical career vocational**

Explanation: low portfolio evidence assessing indentify

1. section career orientation profile engineering duty maintenance ,
installation
2. selection process /; choose a career answering
3. question reward living leave , profession answering
occupational
4. student guidance counselling police opportunity
5. engineering electrical , excellent talent
6. Engineering , break down m material study career and fire
armed career basic advance filing essential
7. Career : understand job by sleet skill opportunity policing , job
duties that what requirement job policing ,correlation of job
engineering teach ,inspection duty engineering
Duty engineering college peace duty responsible protection and
enforcing low,
8.2 .objective maintenance low enforcing low
8.2 code ethic
- Special duty assignment case involving college policing duty
career
2.3. Propagation priority opportunity duty
2,3 salary career allowance bursary poling college learner reward
booking
8. 2.4 Duties and qualified money, security engineering priority
Function Company to prevent investigation occurrence

9. Engineering minim cadet junior , what career engineering relate , what are Cree engineering , fire arm , machine polygraph oscilloscope detector injury , profession analyse engineering,
10. Fire arm index chemical ph concentration base acid detection drug substance fire arm system information lab, detection assignment assessment exam record over stack over stoking .

Career Overview

A police officer prevents combats and investigates crime. They are called to criminal situations such as robberies, domestic incidents, drug busts and the like. In addition to this, policer officers patrol the streets to look out for suspicious activity. They are trained to defend themselves and those in need of defence. Within a police station, there is a ranking system. The ranks in the police force are as follows:

- Detective
- Corporal
- Sergeant
- Lieutenant
- Captain
- Deputy chief
- Chief

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1.purpose .memo

1.A-A. /B.B. //CC. ///. DD////EE /////tra outcom A+B+C+D

1.A-A	B.B.	CC.	DD	EE	A+B+C+D+c
.VR1=IA×R A / Vout = - Vin0,6//IE= Ib+ic VR2=(I1- I2)×R2/ VB=R3×(I1- I2)R2/ VR4=I2×4/	Vout = - Vin0,6//IE=I b+ic			Cu+2e ---Cu 0,7 si	1.VR1=IA×R A / Vout = - Vin0,6//IE=I b+ic VR2=(I1- I2)×R2/ VB=R3×(I1- I2)R2/ VR4=I2×4/ ... /////Cu+2e--- Cu 0,7 si
<u>2.ET=</u> R1.I1+R2.I 2+R3.I3 / ET = E1=E3 ET=I1.R1+ I.R2/ ET=I1.R1+ (I1-I2)R3/	R=ℓ×l÷a. R=ℓ×l÷A	IC(sat)=Vc c÷RC	C=k×A× εo÷d		<u>2.ET=</u> R1.I1+R2.I2 +R3.I3 / ET = E1=E3 ET=I1.R1+I. R2/ ET=I1.R1+ (I1-I2)R3/ /R=ℓ×l÷a. // /IC(sat)=Vcc ÷RC///R=ℓ×l ÷A /////C=k×A×εo÷ d
<u>3.IT=√IR° +(IL-IC)°// R1÷R2=1+ &0T1÷1+& T1</u>	// Rt =To[1+&t].	RC= vcc- VCE÷IC, ///RB= Vcc- vbe÷ib B= IC ÷IB	for=1÷2 π√L.C		<u>3.IT=√IR° + (IL-IC)°// R1÷R2=1+& 0T1÷1+&T1</u>

$V_T = \sqrt{V_R^{\circ} + V_L - V_C}$ $Z_2 = \sqrt{R^{\circ} + L^{\circ}}$ -					$V_T = \sqrt{V_R^{\circ} + V_L - V_C}$ $Z_2 = \sqrt{R^{\circ} + L^{\circ}}$ C// // R_t $= T_o[1 + \beta]$ //// $f_o = 1 / (2\pi \sqrt{L \cdot C})$ // $R_C = V_{CC} - V_{CE} / I_C$ // $R_B = V_{CC} - V_{BE} / I_B$ $B = I_C / I_B$
4). $X_L = 2 \times \pi \times f \times L$ / $I_s = I_T - I_C$ $X_C = 2 \times \pi \times f \times 1 / (2 \times \pi \times c)$ $A = \pi \cdot d / 4$ $1 / T_o = 1 / R_1 + 1 / R_2$ $R_{p2} = 1 / R_4 + 1 / R_5$ / $d = \sqrt{4 \rho c l / \pi R}$	// $R_B = V_{CC} - V_{BE} / I_B$ $R_{B1} = R_{B2} \cdot (V_{CC} - V_{BE} / I_B) / I_B$ $R_{B1} = 1 / 10 \cdot R_{E \cdot V_{BE}}$	$N_1 / N_2 = V_1 / V_2$ // $R_E = R_1 + R_2 (N_1 / N_2)$			
5) $1 / R_p = 1 / R_2 + 1 / R_3$ / $R_C = V_C / I_C$ //) $R_{s1} = R_1 + R_{p1}$ $R_{p1} = R_4 + R_5 / R_4 + R_5$	$V \times R_2 / R_C + R_3$	$I_1 (R_E \times \cos \pi + R_E \times \sin \pi)$	$Z_E = \sqrt{R_E^{\circ} + X_E^{\circ}}$ // $X_L = Z_2 = Z_3$		5) $1 / R_p = 1 / R_2 + 1 / R_3$ / $R_C = V_C / I_C$ //) $R_{s1} = R_1 + R_{p1}$ $R_{p1} = R_4 + R_5 / R_4 + R_5$ $V \times R_2 / R_C + R_3$ //) $I_1 (R_E \times \cos$

					$\pi + -$ $x e \times \sin \pi. // // //$ $Z e = \sqrt{}$ $R e^{\circ} + X e^{\circ} // // //$ $X L = Z 2 = Z 3 // //$ $//$
6).RSH=Im -Rm÷Ish/ RSe=V÷Im- Rm			$V L =$ $V P \div Z 1. //$ $//$ $I L = \sqrt{3} \times i$ $p // //$ $P f = \sqrt{3} \times I$ $L \times \cos // //$ $/$ $V = 4,44 \times$ $N s \times p f$		6).RSH=Im- Rm÷Ish/ RSe=V÷Im- Rm/ $V L =$ $V P \div Z 1. // // //$ $I L = \sqrt{3} \times i p // //$ $P f = \sqrt{3} \times I L \times c$ $o s // // //$ $V = 4,44 \times N s \times$ $p f$
7..E=e1+e2 +e3../ E= e×n ../ 1/Rp=1÷R1 +1÷R2÷1÷ R3/ I=emf÷r.t/ E÷r×n)+R V=I×R/ RB = hxr, I=V÷R ,, Vo = I× RP IT= IA+IBc	$Y =$ $m \times N 2 \div N 1. /$ $// // //$ $S = V \times I \times \sqrt{3}$	$S 1. \div s 2, z t =$ $1 \div 1 z 1 + 1 z$			$.. E = e 1 + e 2 + e$ $3. /$ $E =$ $e \times n. /$ $1 / R p = 1 \div R 1 +$ $1 \div R 2 \div 1 \div R 3 /$ $I = e m f \div r. t /$ $E \div r \times n) + R$ $V = I \times R /$ $R B = h x r,$ $I = V \div R ,,$ $V o = I \times R P$ $I T = I A + I B c$ $Y =$ $m \times N 2 \div N 1. //$ $//$ $S = V \times I \times \sqrt{3. // //$ $/$ $S 1. \div s 2, z t = 1$ $\div 1 z 1 + 1 z$
8.)VRM=1÷ √2 VM=0,707 VDC=2÷π I=0,318 ×Ia×z×p×	$B =$ $\phi \div A, H = I N \div$ l $F = B \times L \times I$ $E = \Delta \phi \div \Delta t$	$E = B \times L \times V$	$I T =$ $V C = I \div R$ $C.$ $f \text{Integral}$ $V. b$	$X L = 2$ $\times \pi \times f,$ $X C$ $= 1 \div 2$ $\times \pi \times f,$ $V C =$	8.)VRM=1÷√ 2.. / B= $\phi \div A, H = I N \div l /$ $/$ $V M = 0,707.$

ϕ.				IT(-jxc	/ F=B×L×I // VDC=2÷π. / E=Δϕ÷Δt // I=0,318 ×Ia×z×p× ϕ. ./ E=B×L×V// IT= VC=I÷RC. fIntegral V.b /// XL=2×π×f, XC =1÷2×π×f, VC= IT(-jxc
) 1÷2×Ia×z÷ 2P/ IZ÷2c2p×4 0÷3c / ATp=IZ÷2C 2p×(1- 40÷360)÷/	V= K×Q×÷r// C=εr×Co×A /d// F=k×q1×q2 ÷r°// Ek=Q×V	XL= 2×π×f/// IL= v×I÷j×xl/// /	Z2=1÷h oe- hf÷h.e+ Rs//// Z2=1÷ hoe////		9) 1÷2×Ia×z÷2 P/ IZ÷2c2p×40 ÷3c / ATp=IZ÷2C2 p×(1- 40÷360)÷/ V= K×Q×÷r// C=εr×Co×A/ d// F=k×q1×q2 ÷r°// Ek=Q×V// // XL= 2×π×f/// IL= v×I÷j×xl/// Z2=1÷hoe- hf÷h.e+Rs//// / Z2=1÷ hoe////
10.)N=v-Ia Ra÷k.ϕ/ Q= v×π×d					

$B = u \times o \times l \div 2 \times r /$					
$Q = V \div d ,$	$C's = C1 + C2$ $V = \text{celerity} \times f$	$1 \div C = 1 \div C$ $1 + 1 \div C2$ $1 \div C = 1 \div C$ $1 + 1 \div C2,$	$AT = Q1 =$ $Q2 = V \times C$ $W = 1 \div \times$ $Q \times V$ $So = h \times f$ $\times e \times R \times L$ $\div n \times e$		$Q = V \div d , //$ $/$ $1 \div C = 1 \div C1 +$ $1 \div C2$ $1 \div C = 1 \div C1 +$ $1 \div C2,$ $/// C's = C1 + C2$ $V = \text{celerity} \times f$ $// AT = Q1 = Q2$ $= V \times C$ $W = 1 \div \times Q \times V$ $So = h \times f \times e \times R$ $\times L \div n \times e ///$ $Zo = R \times c \times h //$ $/$ $RL //$ $Z2 = ZL. ///$
13.) $NP \div NS = VS$ $, /$ $m = EQ(V \div r)$ $\times Q$ $emk = B \times L \times$ $Vb /$	$Qse = Qse = Q$ $T = Q1 = Q1Q$ $///$ $Qp =$ $Q1 + Q2 + Q$ $Co = C1 + C2$	$Z2 = RB //$ Rb° $T1 = RbT /$ RbT			13.) $NP \div NS = VS, /$ $m = EQ(V \div r) \times$ Q $emk = B \times L \times V$ $b /$ $/// Qse = Qse =$ $QT = Q1 = Q1Q$ $///$ $Qp =$ $Q1 + Q2 + Q$ $Co = C1 + C2$ $/// Z2 = RB //$ Rb° $T1 = RbT / RbT$
$1 \div ZT = 1 \div R -$ $j(1 \div XL -$ $1 \div xc) /////$	$IT = IR - j(iL -$ $IC) /////$	$a + jb =$ $\sqrt{a^\circ + b^\circ} /////$			
$f = \Delta L \div L ,$ $f = S \div E$	$Rt = A \times e^\circ$ $\exp .Bt. //$	$L = AR \div R \div$ ΔL	$R \div \text{teta} =$ $r(\cos$		$f = \Delta L \div L ,$ $f = S \div E //$

	$VA = R_2 \div R_1 + R_2$	$= R = \text{resistivity}$	$\text{Teta} + j \sin \text{Teta} // f = 1 \div 2\pi \times \sqrt{1 \div R_c - R_2 \div L_2}, z d = K$		$L = AR \div R \div \Delta L$ $= R = \text{resistivity} \times L \div d //$ $R_t = A \times e^\circ \exp .Bt. //$ $VA = R_2 \div R_1 + R_2$ $R \div \text{teta} = r(\cos \text{Teta} + j \sin \text{Teta}) // f = 1 \div 2\pi \times \sqrt{1 \div R_c - R_2 \div L_2}, z d = K$
16). $\tan \pi = \sqrt{3(P_2 - P_1) \div P_2 + P_2}$	$V = w. \times \sin(\pi + \text{Alpha})$	$I = w \times \sin(\pi + \text{alpha})$	$ZT = VW < \alpha \div Iw \div \text{alpga}$		16). $\tan \pi = \sqrt{3(P_2 - P_1) \div P_2 + P_2} //$ $V = w. \times \sin(\pi + \text{Alpha}) //$ $I = w \times \sin(\pi + \text{alpha}) //$ $ZT = VW < \alpha \div Iw \div \text{alpga}$
17) $Fr = 1 \div 2\pi \sqrt{LC}$ $I_{aveg} = I_1 + I_2 + I_3 + \dots I_n \div n$	$I_{rm} \div wg = \sqrt{i_1^\circ + i_2^\circ + i_3 + \dots i_n} //$ $f = 1 \div 2\pi \times \sqrt{L.c}$				17) $Fr = 1 \div 2\pi \sqrt{LC}$ $I_{aveg} = I_1 + I_2 + I_3 + \dots I_n \div n //$ $I_{rm} \div wg = \sqrt{i_1^\circ + i_2^\circ + i_3 + \dots i_n} //$ $f = 1 \div 2\pi \times \sqrt{L.c} //$
18). $V_s = \pi \int .b, a (y^\circ 1 - y^\circ 2) Am - y = \text{into a b (rdA)}$	$n = 2 \times \pi \times Nr \times (w - S) \div 60 \times I \times v ,$	$I_2(I_1 + I_3)Ra + (I_1 + I_2 - I_4^\circ) \times Ra + (I_3 + I_4) \text{Rotor} = (I_1 + I_2)V - (I_1 + I_2 - I_4)^\circ$	$N \text{ generator} = I \times v \div Iv + Ia^\circ \times Ra + Ra + Is \times v .I)$		$n = 2 \times \pi \times Nr \times (w - S) \div 60 \times I \times v ,$ $\text{Efficient} = \sqrt{I_1 \div I_1 + I_2}$ $I_2(I_1 + I_3)Ra + (I_1 + I_2 - I_4^\circ) \times Ra + (I_3 + I_4) \text{Rotor} = (I_1 + I_2)V - (I_1 + I_2 - I_4)^\circ$ $\text{Efficiency motor} = N -$

					$(I_a^\circ - R_a + (I_a \times v + I_s \times V \div IV)$ N generator = $I \times v \div Iv + I_a^\circ \times R_a + R_a + I_s \times v.$ I)
19. $C = Q.n\sqrt{f} \times L \div 2\pi //$ $v(\text{drop} R) R$	$\epsilon = N.\Delta \phi \div \Delta t //$ $\epsilon = N.\Delta \phi \div \Delta t$	(drop) $L.I .///$ $I = Q1.I1$ $V = V_b - V_a //$ $V(\text{drop} - \text{total})$	$T_a.\alpha$ flux \times $I_s) .$ $E_b O \times \text{flux} \times N \times Z$ Efficient = output \div input		19. $C = Q.n\sqrt{f} \times L \div 2\pi //$ $v(\text{drop} R) R$ $\epsilon = N.\Delta \phi \div \Delta t //$ $V(\text{drop})$ $L.I .///$ $I = Q1.I1$ $V = V_b - V_a //$ $V(\text{drop} - \text{total} .///$ $T_a.\alpha$ flux \times $I_s) .$ $E_b O \times \text{flux} \times N \times Z$ Efficient = output \div input
20. vb- $vA .Q \div \epsilon \times d \div A.//$	output /// Copper loss = $I \times T$ Efficient = 1-				20. vb- $vA .Q \div \epsilon \times d \div A.//$ z peak maximum Voltage input \div output /// Copper loss = $I \times T$ Efficient = 1- losses \div input

.(derive partial .p÷ derive partial v)= (Alpha.p ÷alpha .v) (alpha .p÷a plha.t) /	Iaveg=Vave ÷r// VAve= V.ave÷r.l//	Line = VRy- ,VRy =VYB I1=IR-IR			21.(derive partial .p÷ derive partial v)= (Alpha.p ÷alpha .v) (alpha .p÷apl ha.t) / Iaveg=Vave÷ r// VAve= V.ave÷r.l// Line = VRy- ,VRy=V YB I1=IR-IR
22)_G(JW)// inte v2, V1..p×d×	R.T into v2.v1 .dv÷v ..//	n.1/n2= sin .π/sinπ			22)_G(JW)// inte v2, V1..p×d×v // R.T into v2.v1 .dv÷v .. // n.1/n2= sin .π/sinπ
23).P= m×R×T÷T/.	= s./// f= n×T÷2×l.		Z2√R2°+ SXo°///		23).P= m×R×T÷T/. Eo÷v1=zr÷z s. I = s./// f= n×T÷2×l. //// Z2√R2°+SXo °///
24).T= 2 π, √ l÷g	F= ^R).For.q 1.q2				24).T= 2 π, √ l÷g // T= 2 π√m÷ k.kg // F= ^R).For.q 1.q2÷R.R

<p>25)..C.c÷f. m</p> <p>26). Int.int.int x×y×z Dy Int 5. ,1. Int 1.2 into 3 0 [x °×y×Z</p>	<p>m/// F=q2×E1</p>				<p>25)..C.c÷f.m =C.C÷F.m.c ×v÷m/// F=q2×E1 //</p> <p>_____</p> <p>_____</p> <p>26). Int.int.int x×y×z Dy Int 5. ,1. Int 1.2 into 3 0 [x °×y×Z</p>
<p>27)..Ns- N÷Ns//. R/2/// R2= SX0</p>	<p>///. VR= = VL×√3</p> <p>ZBC=zAV=R ÷ #+jxl÷ #///</p>	<p>÷ #+jxl÷ #/ // VBC=I2×Z BC /// VC= VBC+VR</p>			<p>27)..Ns- N÷Ns//. R/2/// R2= SX0 ///.x l/2 ///. VR= = VL×√3</p> <p>ZBC=zAV=R ÷ #+jxl÷ #/// VBC=I2×ZB C /// VC= VBC+VR///</p>
<p>28)P= √3×VL×IL× cos S= √3×VL×Is/ Er= I×zs</p>		<p>Er= I×zs/ zS=Ra+jxs //// Er=IZs IRa</p>			<p>28)P= √3×VL×IL×c os/ Eph= er/ S= √3×VL×Is/ Er= I×zs/ zS=Ra+jxs//// Er=IZs IRa</p>

30.). P=not (w- p)×9,81×π ×D×n//	IR=V÷R IN=√x- coml°+ I y comp IN=	IN= IR+IR+It+ IB _____ _____ _____ _____			30.). P=not (w- p)×9,81×π× D×n// IR=V÷R IN=√x- coml°+ I y comp IN= IR+IR+It+IB _____ _____ _____
30.). P=not (w- p)×9,81×π ×D×n	IR=V÷R IN=√x- coml°+ I y comp IN= IR+IR+It+I B				30.). P=not (w- p)×9,81×π× D×n// IR=V÷R IN=√x- coml°+ I y comp IN= IR+IR+It+IB _____ _____ _____
31).O= Efficient max = k×s×cos©÷ k×s×cis©+ Po+k°ps	F= N.P÷60///EP =E.L÷√3				31).O= Efficient max = k×s×cos©÷k ×s×cis©+Po +k°ps/ F= N.P÷60///EP =E.L÷√3
32) d= E÷ 2kf×kd×kp ×fz// Cos©=O÷s	Mean = 3×√2÷h - vline	- vline ///= √2÷2×2π ×vrm÷(1+ cos©)/// Vmean=√2 ÷π×vdm×(1+cos alpha	Vmean= √2÷π×v dm×(1+ cos alpha)/// Vmean = V× √3.√2÷2 π<+(1+ cos		Cos©=O÷s//. vmax = √2×vrm // Mean = 3×√2÷h - vline ///= √2÷2×2π ×vrm÷(1+co s©)/// Vmean=√2÷

			$\alpha)///$ $,,R= T-$ $T2 \div p=1/$ t		$\pi \times vdm \times (1+c$ $os \alpha)///$ $Vmean = V \times$ $\sqrt{3}.\sqrt{2} \div 2\pi < +$ $(1+\cos$ $\alpha)/// ,,R=$ $T-T2 \div p=1/t//$
33).T= $3 \times s \times E0^{\circ}/2$ $\times \pi \times n$ $(R2^{\circ} +$ $[S.Xo]^{\circ}/$ A=B(ie exp I/t V=E.(I-#e- exp t/t)	$VD= vs$ $\times (R1 \div R1 + R$ $2 -$ $R3 \div R3 + Rth$ $)/)$ $Vi=$ $iL \times R1 \times R2 \div$ $R2, =.$	$=$ $Vo.R.m \div R$ $M+RT$ $Vo=$ $RC.dv1(t) \div$ $dt=1 \div RC.$ $Inte V1.$ $(t).dt+dtvc$ $(o$			33).T= $3 \times s \times E0^{\circ}/2 \times$ $\pi \times n (R2^{\circ} +$ $[S.Xo]^{\circ}/$ A=B(ie exp I/t V=E.(I-#e- exp t/t) $VD= vs$ $\times (R1 \div R1 + R$ $2 -$ $R3 \div R3 + Rth)/$ $/)$ $Vi=$ $iL \times R1 \times R2 \div R$ $2, =.$ $Vo \times R1/R2$ $=$ $Vo.R.m \div RM$ $+RT$ $Vo=$ $RC.dv1(t) \div dt$ $=1 \div RC. Inte$ $V1.$ $(t).dt+dtvc(o)$
Gma×Gms ÷r°=Gms× Gms÷4×10 exo 8. a=ΔV÷Δt, Speed = distance ÷timr V=u+V÷2	$V=u+V \div 2, //$ $S=(u+V)//$ $V=u+at //$ $V^{\circ} = u^{\circ} + 2as$ $S^{\circ} = u^{\circ} + 2as$ $S=UT+1/2at$ $^{\circ}$ $F=m \times a$	$S=UT+1/2$ at° $F=m \times a$ $F=m \times g + m$ $\times g$ $F=m \times g -$ $m \times g$			$a=\Delta V \div \Delta t,$ Speed = distance ÷timr $V=u+V \div 2, //$ $S=(u+V)//$ $V=u+at //$ $V^{\circ} = u^{\circ} + 2as$ $S^{\circ} = u^{\circ} + 2as$ $S=UT+1/2at^{\circ}$ $F=m \times a$ $F=m \times g + m \times$ g $F=m \times g - m \times g$

$m_1 \times u_1 + m_2 \times u_2 //$ $M_1 \times .u_1 - m_2 \times u_2$ $V = w \times r //$ $V = 2 \times \pi \times n \times r \div 60.$ $V =$ $\pi \times n \times D \div 60$ $D + (t + t) \div 2$ $//$ $Fe = T_1 - T_2 //$ $P -$ $Fe \times \pi \times D \div 6$ 0	$D \div 4 \times 4 - \pi \times d^\circ \div 4$ $V = \pi \times D \times n \div 60$ Belt velocity $V = \pi \times D \times n$ $nA \times DA = nA \times DA \div nB$ $T = T = FX's$ $L = f \times \cos$ Moment = $L \times M$				$m_1 \times u_1 + m_2 \times u_2 //$ $M_1 \times .u_1 - m_2 \times u_2$ $V = w \times r //$ $V = 2 \times \pi \times n \times r \div 60.$ $V =$ $\pi \times n \times D \div 60$ $D + (t + t) \div 2 //$ $Fe = T_1 - T_2 //$ $P -$ $Fe \times \pi \times D \div 60$ $//$ $\pi . D \div 4 \times 4 - \pi \times d^\circ \div 4$ $V = \pi \times D \times n \div 60$ 0 Belt velocity $V = \pi \times D \times n$ $nA \times DA = nA \times DA \div nB$ $T = T = FX's$ $L = f \times \cos$ Moment = $L \times M$ Equilibrium $P \times \cos 30^\circ -$
$E_1 = T_1 - T_2 \div T_1 = 100$ $\% //$ $P.v /$ $p = vRt \div m = V^\circ$ $n = w \div Q = 2 - T_2 \div T_2 \times 100$ $0 //$ $P_1 \times V_1 \div T_2 = P_2 \times V_2 \div T_2; //$ $Q = W = P_1 \times V_1 \times \ln \times V_2 \div v_2 //$	$P \times V =$ $m \times R \times T. //$ $Q_1 = m_1 \times C \times \Delta t , //$ $Q = m \times l \times v //$ $U = m \times CV(T_2 - T_2) . //$ $(V_2 \div v_1) \alpha$ $a = T_1 \div //$	Alpha = $cp \div cv //$ $W =$ $m \times R \times t_1 \times \ln(P_1 \div P_2) //$ $(P_1 \times V_2) = (P_2 \times v) //$ $f . \exp$ $1 = f \times v \div v - v //$			$E_1 = T_1 - T_2 \div T_1 = 100$ $\% //$ $P.v /$ $p = vRt \div m = V^\circ$ $n = w \div Q = 2 - T_2 \div T_2 \times 100$ $//$ $P_1 \times V_1 \div T_2 = P_2 \times V_2 \div T_2; //$ $Q = W = P_1 \times V_1 \times \ln \times V_2 \div v_2 //$ $SF = 4,187 \text{ Intf} \div 273. //$ $T_2 \div T_1 = (P_2 \div$

$SF=4,187 \ln \frac{T_2}{T_1} \div 273. //$ $T_2 \div T_1 = (P_2 \div P_1)^{\frac{1}{\alpha}}$ $W = P_2 \times v_1 - P_2 \times V_2 \div \alpha$ $1 \div \alpha //$					$P_1)^{\frac{1}{\alpha}}$ $W = P_2 \times v_1 - P_2 \times V_2 \div \alpha$ $1 \div \alpha //$ $P \times V = m \times R \times T. //$ $Q_1 = m_1 \times C \times \Delta t, //$ $Q = m \times l \times v //$ $U = m \times CV(T_2 - T_1). //$ $(V_2 \div v_1)^{\alpha} = T_1 \div T_2 //$ $\alpha = \frac{C_p}{C_v} //$ $W = m \times R \times T_1 \times \ln \left(\frac{P_1}{P_2} \right) //$ $(P_1 \times V_1^{\alpha}) = (P_2 \times V_2^{\alpha}) //$ $f \cdot \exp \left(\frac{1}{f} \right) = f \times v \div v - v //$
$\int (ax+bx) dx = \frac{a}{2}x^2 + \frac{b}{2}x^2 + C //$ $(a \times (p+x \div p \times x) + 4(p+x \div p \times x)) [X \cdot by \times (p+y \div p+x)]$	$2x \times x + 33x + x dx$ $(a+b) \exp 3 = a \cdot a + 2a \cdot ab + 2ab \cdot b + b \cdot b$				$40.) ax+bx = (p+x) \cdot (a \times (p+x \div p \times x) + 4(p+x \div p \times x)) [X \cdot by \times (p+y \div p+x)]$ $2x \times x + 33x + x dx$ $(a+b) \exp 3 = a \cdot a + 2a \cdot ab + 2ab \cdot b + b \cdot b$ $(a+b) \exp n = \text{combination } c \text{ n to n} \cdot a \exp n-1 + c$

					<p>41) F ®---</p> <p>>[gain]---</p> <p>>[op.Am]--</p> <p>>[DC motor -</p> <p>>-->.</p> <p>Tachometer</p> <p>-----</p> <p>----- </p> <p>--->[G(s)]--</p> <p>>[G.p]--> ©--</p> <p>>[Gp(s)]--</p> <p>>[G's(s)]</p> <p>--> ©--</p> <p>>[controle]--</p> <p>>[power</p> <p>conver]-plan</p> <p>®</p> <p>Intrusion ---</p> <p>[ideal</p> <p>sensor]</p> <p>©--> ®--> ®---</p> <p>>[G1]--</p> <p>>[G2]--[G3]</p> <p>-->[G4]--> ®</p> <p>[G5]</p> <p>.</p> <p>.</p> <p>[G6]</p> <p>©--> ©---</p> <p>>[G1.G.2G.G</p> <p>4..]---[G5]---</p> <p>-----</p> <p>H0-----</p> <p>[G4]---</p> <p>-----</p> <p>H6-----</p> <p>[G6]---</p>
<p>___42)</p> <p>so=X1+x3+</p> <p>X5</p> <p>S1=x2+x3+</p>	<p>Input</p> <p>/ output/</p> <p>register</p> <p>X1,x2,x3,X4,</p>				<p>-</p> <p>_____</p> <p>_____</p>

x6+x+x7 S3=S4+X5	X5,x6, S2,S1,s0/				<div>4</div> <div>2)</div>
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Basic trade theory fundamental design

Requirements:

Construction trades composition:

Operational trade low rules

applier skill to skill ,, trade to trading

- 40. Sabs code of practice wiring premise

Safety trade tools , safety I rules harss play machine building sign fire smoke , injuries fire hazard warning, cut space save damage of good is prevented.

- cell advance construction simple efficiency full load 976 silent operational

Transfo little care :

- open -air cooling oil cooling,
- transformer assumed to have no loss et.

- secondary cell advance.

Rechargeable greater capacity than primary cells ideally suited emergency back a application la get life disadvantages more expensive than primary cells regularite maintence periodic charging traditionally less suited for portable application,

- code colour resistance : sketch IEC circuits carbon resistance potential variable

capacitor , zener diode , pnl transistor battery cells unity polarization carbon extrinsic

- yoke , poles sgoeas bushes backwards in the motor .

- moving brushes in generating poles field poles series .

- number of pairs of poles used .

- strength magnetic field.

- rate magnetic field .

- rate magnetic flux cut by the moving conductor,

- number of active conductor

- effective field flux reduce armature as load , generator.

41. Engineering drawings :
welding PC aides draughtinf , join metal

Free hand boxe screw thread ,

- arc welding gas welding
resistance lap joint , T joint career joint butt joint

Screws threads ,

- correct linework accuracy neat first angle orthopedagogic projections coupling projection machining .

-42.. generator ward Leonard motor generator system .

Shunt generator used where constant voltage is required.

- series generator a booster on DC line transmission line ..flux armature .

43 .trade domestic appliances .

- washing machine immersion water heater protection steel conduct pipe earth

44. Moving - iron instrument , non linear scale measure DC and AC cheap robust affected by stray damping by air .

45. Moving - oil instrument linear scale measure only DC expensive very accurate damping edy ,

46. Convert AC generate output to a pulsating DC and act as , period time peak value cosinys

.47. illumination high pressure Mercure vapour discharge lamp , siduim vapour discharge.

Cold cathode neon

- AC current theory, Serie RLC impedance phase ,

-48. three phase AC system wave supplies

-49. transformer secondary primary.
 DC machine test conducted.
 . switchgear and protected device :funci and operation induction.
 -50. application of induction disc relay . current and voltage break capacity of .
 -51. reverse phase relay rotation of a three phase line they operate differente power level usually work by a solid
 52. AC machine,
 53. Measurements instrument electronics.
 53 material used in manufacturing of semi conductor device.

54.Special characteristics :
 Def . special arc furnace transformer power requirements.

55. Control system like all other components on electrical network allowed for process to monitored and regulated from a remote.

56. Special characteristics controle system operate environment controle system or overall electrical.
 Static controle analogue .

57. Electrotech : principle nuclear positive Lenz lot directly proportional yoke download.
 Type material algebraic sum EMF
 - principal low change in the magnetic flux linking with .

- movement of conductor in a magnectic field.
 - increase decrease of current circuit .
 - carbon brushes, graphhic brushes ,electrographes, copper graphite.
 Separately.

Efficiency full load ,97 moving silence magnetic circuit winding oil tank protection refrigerator,
 -57.1 connecting electrical machines practical tips .

For connecting

-make sure you have righth joint check size of logs .

-Make sure that you have a crimping .fit purpose joint.

* Installation core operate .

* Installation care and inspection of equipment locating t righth tools for the jobs..

* Make sure that you know which equipment,keep your tools box organise stored your tools safety clean in good working..

* 57.2. Generation and supply of AC

* Power fact correction low power factor increase decrease electricity bill.

*Method of power correction capacitor basic generate another method of power factor synchronouse motor be set to operate in logging on leading.

* AC synchronouse machine synchronouse converted mechanical energy input induction machine.

* Load Brid connectioning charge series connect to shunt .

- speed and torque:

- torque and power:

Load sharing divider load .load among a set

to

TSHINGOMBEK

B

50. Cpd continue learner

Calculus

Kirchoff,

e1 source, RLC Serie RLC ,i1,i2,

$$dq \div dt = 1 //$$

$$\begin{aligned} L \times d^{\circ}1 \div + R \times di \div dt + 1 \div C = dv \div dt \\ (L1 + L3) \times d^{\circ}i \div dt^{\circ} + \\ (R1 + R3 \times di \div dt + (C2 + C3).i1 - \\ ld^{\circ}i2 \div dt - R \times d1.2 \div dt - c3.12 = e1(t) /// \\ (L2 + L3) \times d^{\circ}i \div dt^{\circ} + \\ (R2 + R3) \times di3 \div dt + (c\# + C3)i - \\ L3 \times d^{\circ}i\# \div dy - R3 \times di \div dt - C3.I1 = e2(t) \\ t=0 \text{ and } t, t = 0, 2 \\ e1(t) = 100 \sin (120\pi t) ... // \end{aligned}$$

Contour symetry

$$\text{Int} . H \times dl = \sum n1. - n2.i2$$

-;a Di/dt detection circuit DC

unidirectional breaker

$$\begin{aligned} di \div dt, V = R.i + L \times di \div dt \\ I = (v \div R) \times (1 - e(t/T)), \text{ differential the} \\ \text{above value, diffential the above} \\ \text{value } Di/dt = (1/l) e \text{ the maxim,} \\ di \div dt, di \div St) \text{ max} = // \end{aligned}$$

Potentiometer coefficient reducing
voltage integration factor, sum
integrator

$$\begin{aligned} dx \div dt. TV, E = {}^{\text{TM}} L. dl \div dt \ln + 1 \div c \\ \text{integral } dt./ \\ L. di \div dt + R. i + 1 \div c \text{ integral. } 1. dt = E \\ Rd \div L. dt + 1 \div Lc = d.y. \div dy \\ do = [f(x-y)St.. \\ 5dx \div dt + 3x \div 5 = 0 \text{ out put integraj} \\ dx \div St = 3x \div 5 \end{aligned}$$

$$\begin{aligned} \Delta v2 \sim V20 - V2 = R_s.I2 \cos \\ \alpha + x s I s2. \sin. . \alpha \\ \sqrt{4} \Delta v2 = \sqrt{3} (R_s I2. \cos \&2 + X's. I2. \sin \\ \&1/ \end{aligned}$$

$$\begin{aligned} \& \\ f(x) .. d \div dx \times f(x) .. / \end{aligned}$$

$$\begin{aligned} d \div dx [f(x).g(x)] = f(x).(g) + f(x).g(gx)/ \\ a(x+b \div 2a) = a + x.x + \end{aligned}$$

$$\begin{aligned} b \div a + (8.b \div 2a).(8.b \div 2a) \\ A \div ax + b + B \div (ax+b)(ax+b) \\ + ... G \div (ax+b)n // \\ \text{Firs second order} \\ dy \div dx + Pay = Q \\ a.(d.dy) \div dx .x + b.dy \div dx + cy = \\ f(x) // \\ \text{Volum.} \Delta v \pi \checkmark .y.y \Delta x \\ VX = \pi. \text{ Inte. } b \text{ to } a (X1. - x2) \\ dyb. .vy = 2\pi \\ X = Am - y \div A = \text{into } (a) . \text{to } b \\ rdA \div A, // \\ (x,y) = f(t); g(t) \end{aligned}$$

$$\begin{aligned} ds \div dt = v, dv \div dt = d.d.s \div dt // \\ f(t)S = 40t - 5.t.t \\ f(t') = 40 - 1, 0.t \\ ,M \end{aligned}$$

$$\begin{aligned} \bar{V} = \pi.r.r.h // . r.r = L.L - h.h \text{ cone} \\ \text{high} \\ X.x + r.r = \\ R.R.V = 1 \div 3.\pi.r.r.h \\ = 1 \div 3.\pi(R.R - x.x)(x + R) \\ = 1 \div 3\pi[R.Rx + R.R.R - x.x.x - Rx.x] \\ \text{Partial differential} \\ Z = x.z.z.y.t.. \\ \text{Lim} . \&v1 \div \&h = dv1 \div dvh. \\ h --- \\ \text{Volume cylinder} , , , \text{unit} \\ \text{Gravitation centroids..} \\ x + y + z = 1 \\ \text{Double integraj} , , \text{single variable} \\ \text{sum I.double, Sum } j f(x,y) \\ y = (x, u@) , , , y = (x + \&x) \text{ and } \Delta y - y, u \\ (x,u) \text{ total derivatives,} \end{aligned}$$

$$dy \div dx = dy \div du \times du \div dx. \text{ partial constant}$$

Inspection of work equipment :to
indentify wether equipment can be
operate maintained safety ,

deterioration ,
Check risk safety in case inspect
where significant and safety
installation, installat reinstallation
deterioration or any other need for
inspect frequency should .

- to operator and other equipment
installation result
- work equipment that requires
inspect inspection b,
- reg where the safety of work
equipment depend .
- intervart equipment.

- wath should the insoy. Deoenyon
type of work t use any
manufacture recommanday the
advit ,trade sourt

Load

$Z_{total} = ZC/(ZL-UE)_{..}$

$VA=S+VAR \text{ -----}.S=P+Q//$

gradient DE fonction

$\&f(x,y) \div \&y = \& \div \&y_{,,}$

$\ln|x|+C$

$\text{Int } I/x$

Equivalent transfo

$E2= I2 \times z2 + v2 //$

$E2-v2=I2 \times Z2_{..} //$

$Vre\% = E2.v2 \div v2 \times 100_{..}$

$V \text{ reg}\% = I2.R2.\cos\$$

$+I2.x2.\sin\$ \div v \times 100$

50.) Cpd development skills

$Z=\sqrt{R-(xl-xc)}/$

$V=Z \times I,$

$Z=R$

$P=R \times I \times I$

$V=U \times \sqrt{3}$

$I=j \times \sqrt{3},$

$U=V \div \sqrt{3}$

$I=j \times \sqrt{3}$

$J=I \div \sqrt{3},$

$J=IL1, IL 2,$

$3R_{...}, R :3,3 xl = 22 \times \pi \times L \times f$

$XC=1 \div 2\pi cf$

$ZT=(1 \div z1 + 1 \div Z2 + 1 \div Z3)_{..}$

$=G1+G2+G3)_{..} 1 \div GR + 1 \div G2 + 1 \div G$

$3_{..}$

Engineering electrical load system

$R.I.I=3 \times R \times I \times I_{,,} R \times I \times I \div 3_{,,}$

$I=j_{,,}$

$I=j \times \sqrt{3}$

$\text{Load} = \sqrt{3} \times R_{,,} I=j_{,,} \dots$

$I=j \times \sqrt{3}$

$P=R \times (j \times \sqrt{3})$

$P=R \times j \times j \times 3$

$P=3.R.j.j$

$E=1 \div R1 + 1 \div R2 \times j \times j \times t$

$E=R1 + R2 \times j \times j \times t$

$E=3 \times (1 \div R1 + 1 \div R2) \times j \times j \times t_{..}$

$E=Em \times \sin \times w.t$

$E=j \times 3 \times R \times j \times j \times d$

$Z=1 \div Z1 + 1 \div Z2 + 1 \div Z3_{---}$

$G1+G2+G3_{,,} Z1+Z2+Z3$

$E=3(Z1+Z2+Z3)(j.t)$

$E1=(1 \div z1 + 1 \div Z2 + Z2)(j \times t)$

$E1=(1 \div Z2.1 + 1 \div Z2.2 + 1 \div Z3.3)$

$(j \times t)$

$E2=1 \div Z3.1 + 1 \div Z3.2 + 1 \div Z3.3(j \times t)$

$ET=[1 \div z1 + 1 \div z2 + 1 \div Z3(j \times t)] \times [(1 \div z$

$2.1 + 1 \div Z2.2 + 1 \div Z3.3)] \times [1 \div Z3.1 +$

$1 \div Z3.2 + 1 \div Z3.3](j \times t)$

$[Z1+Z2+Z3(j \times t)] \times [Z2.1+Z2.2+Z2.$

$3] \times [Z3.1Z2+Z3.(j \times t)]$

$ET=1 \div Z1 + 1 \div Z2 + 1 \div Z3(j \times j \times t). \times [Z$

$2.1+Z2.2+Z2.2+Z2.3]$

$[j \times j] \times [Z3.2+Z3.2+Z3.3 \times (j \times j. \times t)_{..} //$

Serie LC ,,capacitor ,resistor load

series parallel impedance low

related

Evidence low energy

$C=Q/4$
 $..Q=u \times u \times c \times w$
 $\Delta=Q=3 \times U \times U \times C \times w$
 $W_e=3 \times V \times V \times C \times w$
 $CV=3 \times c \Delta$

$E_p=P \times I$
 $E_1+E_2+E_3..$
 $Q=$ iron ,, Q_{in} iron
 $I_A, I_B+I_C,,$
 Diagram fresnel ,,
 $I_n = I_1+I_2+I_3,, \alpha=0,, V_{2N},, \alpha=90!$

Vector fresnel

$I_1=j1.2-j3.1$
 $I_2=j2.3-j1.2$
 $I_3=j3.1-j2.3$
 $I_1+I_2+I_3=0$
 Delta balance
 $I=\sqrt{3} \times j \times$
 $J1.2=U=z.1.3$

$V=u\sqrt{3}..I_L=I_z,,$
 $VZ1=VZ2=VZ3..I=Z, I=I_L=I_L=V \div Z$
 $..V=U \div \sqrt{3}.$
 $I_A=V \div Z, Z=U \div Z \sqrt{3}..$
 $I \Delta=U \div Z \times \sqrt{3},, U.\sqrt{3} \div 3.Z$
 $I_{star} l = V \div z=u \div \sqrt{3} \div Z,,$
 $I_{stars} =u \div z \times \sqrt{3}=u \times \sqrt{3} \div 3 \times z$
 $Part= U \times I \times start \times \sqrt{3} \times \cos \alpha ..$

60. Engineering sinusoidal quantity sinusoidal

$-U_m \times \cos \times (wt+j)..$
 $-1 \div T. \int T. u dt,, u > 2 \div T.$
 $u= u.o \times 2 \times \cos(wt)$
 $I= i.o \times 2 \times \cos(wt+j)$
 $P=u.O \times \cos w(wt) \times I_o \times \cos(wt+j)$
 $=u.o \times 2 \times I_o \times \cos(w.t) \times \cos(wt+j)$
 $U.2 .I_o \times \cos(w.t)(wt). \times (w.t.j)(w.t.j)$
 Layout fresnel
 $V_1=V_o \times 2 \times \cos(w.t)$
 $V_2=V \times \cos \times (wt-2p/3)$
 $V_4=V_o \times 2 \times \cos(w-4/3)$

$.P=(U \times I \times \cos)+U \times I \times \cos(2wt+s)$
 $K= P/s,, K=\cos j,, A=V \times I \times \sin$
 $\cos(2wt+j)+\cos(\#wt+j-4p,\cos$
 $wt+j-8P/3..$

-process high

$I_{2.2}=J_3-j_2, I_3=j_1-j_3,,=V_k.3$

-balance Pbskance ,

$P= v^2+v^2.I_2+v^3..$

$V_1=$

$V_o \div \cos(wt) \times i=i_o \times 2 \times \cos(wt+j)$

$V_2=v_o \times \cos(wt-2p/3)$

$P_1=V \times I[\cos j+ \cos (2wt+j)]$

$P_2=v \times i[\cos j+\cos(2wt+j8/3)]$

$P < p < p_1+p_2+P_3$

Installation.cinnected load demand

$S=P+jQ./P=V \times I \times \cos s//$

$A=V \times i \times \sin @.. \sqrt{P.P+Q.Q}$

$W=P \times t$

Demand factor = maximum demand \div connect.

Load factor= average load .

Applied engineering science skill
 mathematics : to master skill
 engineering

Part , questions//operational skill//resonning skill .

Total skill total number

Mandatory skill development, //

Engineering context

challenge, analyse with guidance , design development, investigation guidelines exist

Basic knoy engineering key

-role engineering applications of civil mechy design implementation testing control system

_ topic national simple system

subsystem inouth..

Application of low of conservation energy involving kinetic losses

-applied calculation involve work done

and power
 $E_w = FD, E/t$, $E_k = 1/2 m.v.v$, $EP =$
 MGH , $e = v.i.t$, $eh = cm.\Delta.t$.
 _ roles and discipline impact //
 social environment Engineering
 b, social economic impacted
 positive negative.
 Description of function circuit in
 term input process and output.
 - concept current voltage
 measure , calculau involving
 relation voltage low involved
 resistance Serie parallel bdivider of
 operational fixed voltage , voltage
 divider to generated a signal
 - transistor resistance electronics ,
 functionalite of relay protection in
 explanation function of electronic a
 variable voltage divider transistor
 relay output,.
 -applying algebraic skill to linear
 equations bsolving linear equations
 the subject formuler, explanat draw
 graph of value for choses value ..
 Conducting assessement judging
 evidence marked and cerife quality
 assurance, re assessor.
 Question , point process
 accuracy , expected response
 correct answer award, correct
 additional, evidence divisub overall
 strategy, level 5,4

Applied to applied applied skill to
 resolve skill physic mathematics to
 skill electrical panel :///

Principle operational connection :
 basic transfib, threet phase
 advantage application calculation
 Circuit , power , source protection
 device components,
 -

Electrical infrastructure
 construction
 fundamt compulsy, electrical
 principle practice , workshop

practical , physical science
 electrical , electronics
 industrial , math , life orientation
 level 2,4

Career work power station
 electricial
 - electricial system construction
 fault AC,DC , topic operate..
 Introduct to policy theory policing
 practice v.literscyb, office data
 processing to

-Applied skill .to trade and trade to
 applied skill thermal compo

Applied..

Cpd.
 Installation motor three phase ,
 3bulb
 Power factor.
 $Q_{ph1} = u_{ph1} \times I_{ph1} \times \sin @1 =>$
 $Q_{ph2} = u_{ph2} \times I_{ph2} \times \sin @2 =$
 $Q_{oh3} = u_{ph3} \times i_{ph3} \times \sin @3 =$
 $Q_T = Q_{ph2} + Q_{ph2} + Q_{ph3}.$
 Determine impedance.
 $Ph1 = u_{ph,1} \cos$
 $Ph2 = u_{ph2} \times \cos \times ph3.$
 $P = ph1 + ph2 + ph4..$
 Equilibrium
 $V_{ab} + Z_s.i_b = v_{ab} + Z_s.I_a$
 $V_B + zS.I_c = V_{bc} + Z_s.i_b$
 $V_{CA} + Z_s.I_a = V_Cs$
 $V_{ab} = v_{bc} = v_{ca} = I_B = I_C = I$
 $Z_a = z_b = , Z_o$
 $W_a = V_{ab} \times I_a [\cos(30^\circ + q)]$
 $W_C = V_{ab} \times U_c [\cos(39 - q)]$
 $W_a + w_c = v_a.i_a [30 + q]] + v_{bc} I$
 $[\cos(39^\circ + q)]$
 $W_a + W_C = v_l . \times i_l [\cos 30 + q) + (\cos 30)$
 $W_a + wcvl.il$
 $(2 \cos 39 \cos q) = o x 3 \times v \times i p f$

-dephasage , 129, 2, 4, 6 poles.

$$V1(t) = V_{\max} \cos \omega t$$

$$V2(t) = v_{\max} \cos(\omega t + 30^\circ)$$

$$V3(t) = V_{\max} \cos(\omega t + 60^\circ)$$

$$V4(t) = V_{\max} \cos(\omega t + 90^\circ)$$

$$dv1(t) = \int dv_{\max} \times \cos \omega t$$

$$dv2(t) = \int dv_{\max} \times \cos(\omega t + 30^\circ)$$

$$dv3(t) = \int dv_{\max} \cos(\omega t + 60^\circ)$$

$$dv4(t) = \int dv_{\max} \cos(\omega t + 90^\circ)$$

Installation generator g1,2, transfib
kWh, back, retard, avant,
clockwise

a+bi, x+in, complex real power
factor, apparent power factor

Cable line a+BJ, line impedance xj

resistance capacity parallel

connection cable phase

beutraj, power between phase

phase impedance a+BJ, line

2, 3a+bi, line neutral a+bi,

Construction vector fresnel flech

robot scatter drawing vector

quantity phase a,b,c,

cpd

applied to trade, and trade to
applied safety, percentage correct

Applied trade test to trade
company theoretical mathematics
trade theory relevant trade test on
the job supervisor

Commission

Tender value point relate years
expert certified trade, 10 point clear
time frame, clear project plan time
plan responsible of team, equipment
workshop

Log book apprenticeship

Module trade to trade skill report
phase trade, 1,2,3 trade test, module
code, object, criteria tendered
Safety area join crimping fault,
Db fuse AC, motor contruj retain
fault fault applicable to oanrk
fluirencr, isolator, wat unclud rack
flexible conduct

- code man power kefit, not dry
joint no damage nibsolder all safety
adhere testing instruments
conductur 'cabkevmake off PVC
armoured up to 16 mm core
1200v lug join rating correct ovx
- objectivjty relevant colour
marking correct sabs caractere
GAZ welding piece nozke GAZ
lifting, chain ton max work not
exce selected readings all safety
applied

, - criteria recall type battery
percentage parallel correct
manufacture system fit component
procedure ...

El1 electronic components wire
watt carbon metal oxide thyristor
1 construction solder..

-correct according manufacture
adhere procedure cambdr correct
test average value peak frequency
RMS,

Control main circuit line start
dejtad phase rotation,
Cad xlpe cable 2099! test gears,

Cpd learner technical.

equivalent electrical hydraulic ..

Integral countiur infinitive

Stock Maxwell

50)cpd

Engineering

-basic concept introduct discovery:
voltage electrical current
resistance power, conductor
between line

$U = \sqrt{3} \cdot u_{ph}$
 - key term
 : law regulation ohm low state $I = u \div ib$,
 -Kirchoff low: sum bode junction in sum of current node n
 $I1 + I2 + I3 = I4 + I5$.
 Coulomb low :charge $|F1| = |F2|$
 $= K \cdot |q1 \times q2|$.
 -Right hand rules thumb point direct point reminder finger
 field ,direction wire
 First left hand magnetic induction
 second left hand left magnetic
 - resistors connection
 schema ,Serie
 connection /,parallel //connection
 Amperage $I1 = I2 = I3$, // $I1,2 = I1 + I2$
 Voltage $U1,2 = u1 + U2$ // $U1,2 = U2 = U$
 Resistance
 $1/R1 = 1/R1 + 1/R2$ // $1/R1 = 1 \div R1 = 1 \div R2$
 -Joule Lenz , $Q = I \cdot U \times t$
 Amount heater
 -capacitor connection
 Scheme /,serial connection
 //parallel
 Electric charge
 $q1,2 = q1 = q2$ // $q1, Q,2 = q1 + q2$
 Voltage
 $u1,2 = U1 + U2$ // $U1,2 = U1 = U3$
 Capacitance $1/C1,2 = 1 \div C1 + 1 \div C2$
 -lighting .
 Incandescent light type light /light
 socket base //lumen lux///color
 temperature///led start
 Electrical light construction glass
 inert tungsten
 support ,electriclight order
 filament oxydation .
 Manufacture 1,5 volt principal
 heating power / incandescent lamp
 source fluorescent lamp, halogen
 lamp ,#00-409 lamp
 light ,dischylamo service///light
 socket onde noise
 device ,E27,G4///lumen device total
 from///color temoera.
 - cable and wire
 Wire color/ type of cable onde

wire//wire connector///
 IEC 60446 basic softma. Power
 marking
 IEC 60442007,2019IEC 60444
 L1: brain Gray ,// cable
 jacket ,wire coaxial cable signal
 cable flexible filled heliax non
 metallic ribbon cable
 insulator ,stripe /// Zone special
 danger soldering screw terminal ,4
 wire nut terminal block bolted
 wire connector
 - db
 - power station and substation
 electrical substat.
 Nuclear power: no install energy
 schema of operationel
 Plan thermal power : generate
 electricak energy by convert
 chemical, hydraulic power
 wind ,geothermaj
 -boiler turbine power combine
 cycle / spp solar power plan is on
 engineering structure verting
 radiation ponek ,Vacuum tower
 type /,wind power Serie connected
 osgir coak
 - electrical measure:
 -Volmetre instru use measure
 analogic principal
 electromechanic,AC DC pulse
 selected,
 -ammeter device for current ,
 - ohmmeter device ,
 Multiple measure functionalite
 analogic Dmm,
 Clamp meter device operation
 based 10kv,,
 Electricitt meter device measure
 electric energy install ,2,5:0,5:
 - mechanical energy : transformer
 static device convert AC ,expansion
 insulator ,transform ,convert ,
 Motor electrical energy operator
 shaft.-generstor convert
 mechanical energy from AC power
 solar
 - ground system electrical
 engineering DC ,isolation ,n neutsj,

potential

- Protection and automation
device:circuit
breaker,rcd,rcbo,sod,voltage
monitor, magnetic,fuse,
- socket repair/ installation of
build // installation the surface
mounted socket ///switch
installation

/Conche or brick,
1)make a Chanel for cable router
installat junction,2 fill the recession
labell,fill the remaining,drywall
marking drill hide back connect,
// Fix the base to the wall cable into
the base , connect fix the sock
install,///

Make the Chanel for cable mounted
installation the junction with
alabase mirror install fill remayb ,,
-over voltage: I2 and I3 sum voltage
 $u1 + U2 = 389, P1 + P2,$

/IP code. IEC en 60528/ / time
current character time (1,13In ///

tools work wide socket
-Schem electronics circuit
Switch (1and ,2 button,switch (3),
pass through switch ,two key
pass ,socket ,socket ,dimer ,motion
sensor ,impulse relay motor
connection,electricity
- electricity cost calculator,device
power used , daily use time ,price
for kWh cost per hour month days
week

Cpd ..basic electrical continue

$I1 = V2 \div |Z_{total}| < - \text{teta}$
 $I2 = V2 \div Z_{totalj} < (-120^\circ - \text{teta})$
 $I3 = V3 \div Z_{totalak} < (120^\circ - \text{teta})$
 $V1.2 = v1 - v2 = (VLN < 0^\circ) -$
 $(VLN < 120^\circ)$
 $V2.3 = V2 - V3 = (VLN < 120^\circ) -$
 $+ VLN < 120^\circ)$
 $= \sqrt{3} \cdot V_{Ln} < -90^\circ = \sqrt{3} \cdot V \text{ phase } V2$
 $V3.1 = V3 - V1 = (VLN < 120^\circ) -$
 $(VLN < 0^\circ)$
 $= V3 = V_{Ln} < (30^\circ - \text{tets}) - (V_{Ln} < 0$

$I1.2 = V.1.2 \div Z < (30^\circ - \text{reta}),$
 $I3 = V2.3 \div zA < (89 - o),$
 $I3.1^\circ V \times 3 \div Z.a$
 $I.3. \# = v.3 \div ZA < 150.$
 $I1 = U., I1.2 - I@.2 < 129, v3.I2.phaae$
 $3 + 39^\circ =$

Advanced system diagram on line
Design draw breaker type .v
max.max

$R = Z \div \sqrt{x} \cdot x \div R.R + 1,$
 $X = x \div R \times R,$
Full load no load losses ,phase
fault,I3,phase
 $I3phasrE \div X, ILG,,$
 $I \div XS = 1 \div x + 1 : x + 1 \div x = 3 \div x,,$
 $1 \div RS = 1 \div R1 + 1 \div R2 + 1 + R3 = 3$
 $X's = x \div 3,, xs \div Rs = xR = \text{gen } ,x \div R,$
symmetrical b

Voltage system power , $Q = P2 \times \tan$
veta

Cpd,
theory experimental,
Task lab sign domestic and
industrial
Engineering lab electrical
workshop.
Power systems.: electrical shop
tools on precautions practical is
discipline study design
- application equipment systeme
- solid bar copper wire
Awg, 10tp49,
Normal diameter 2,6to 0,76,cross
section 5,39.
-assignment load calculation.
Application appliance / unity
//power rating /// rating ////daily
usage /energy consumption.
Fridge tvfan.

-lab electrical standard wire
size..18aw to 1,
Assessment with is gauge of wire
used exercise b..
 $C = <1 \div 36$.lin
./

Engineering studies practice
240 ,month n diploma NQF

Applie saqa to isat
Practical purpose Isat,scope mark
off basic engineering,topic operate
and monitoring grinder machine
Produced simple
Sub task , activities time frame
Manufacture size,time ,marks
Resource requie.

National
Where appropriate material
undertaking .
Labels.

cpd ,gov body insurance
applie to applied trade to trade

Qualifications framework
equivalent
Assessment frame.
National diploma
engineering.credit
accreditation,policy criteria
minimum maximum ,,
Equivalent trade license: to trade
license translate ..award equivalent
Divide job ,divide task ,divide
operational equivalent
Phase preliminary phase final ,semi
final
Time competition ,cycle recycle
permeant limited continuity
function hand book

-Material strength test material

-Scale ,module word
Interpretation drawing scale
drawing interpretation, building
Geodesie 1/100, 1/10, projection
reduce size mass rules relate rules
re projection planer scape
Scater ,flow shoot

Cpd : body qualifications
framework

Statement of work experience

Log book , instruction programme
national , level
Calcul evaluation equivalente
Credit entry credit exhibition
outcom years // evidence
Experiemental 3years equivalent
 \div
Comparability psychometric :
Calculate time table \div
Id calcule: calculate NQF level 360
credit .
Qcto group calcul evidence group
qualifications:

6years \div 2years = 3 years
equivalente
Frame job years:
Framework handbook . quotatien
intellectuel.
Credit entry 360: \div credit 180 \div = 2
credit awardc,percentage
evaluation 50 \div 100 = 2. Level
Studies engineering.
-Work where appropriate a
applying lubrificT correct assembly
,to assembly in accordance with
specific,standard operate:

-where appropriate applying
packing and or sealing material in
accordance with specifications
operate procedure :

-inspecting and checking the final assembly for conformance to specification.1th,2,th

-where apprit returning the final assembly to use :1th,2th,3th,4th,

-diagnose and repairs analogie equipment and components date sign .look for evidence confirm skill .:

-Diagnose and repair and skill :

-Obtaining and following relevant circuit diagrams Manuel specific schematic: maintenance ,:

-locating reading recording and diagnostic buil in fault .:

- obtaining error code interpretation documents running test fonctionning and recording fault and equipmentb built test .:

-Checking electronics equipment sub assemblies:

-Component connection and termination for conformance to specific .

- removing and replacing component :

-recording results of test understaking on electronics equipment:

:Isolating electronics assembly from the power .:

-adjusti g turning and calibrating electronic equipment sub assembly.:

Returning to service and testing to specification the repaired electronic equipment sub assembly..

- using language and literacy skills to provide brief report record result of test,

Reproduction fault symptom and verify fault using appropriate test.

-Retiring repairs,maintain service,look for evidence skill :

-Look for evidence relevant circuit diagrams manual mainteecird supplier.:

- maintenance error code interpretation documents running test funct and fault and equipment status indicated built in test checking electronics component .:

- interpret technical drawing look for evidence skill in checking the drawing again job requirements related ,procedure interpreting job chart ,docuy checking and clarifu task relate :

Undertaking numerical operation geometry date sign

-checking materuaj exist:

- making termination ,: connection to specific manufacture and regulatory , adjustable marking tagging and calling wire conductor and connection to specification ,:

-connection using language and literacy skill to complete and routine information written job instruction .

-Using measure for checking connection and components binstall and test electrical wiring .

Code trade : job specification pertaining system operating and relevant plant personal with respect identify deflecting control fault deflecting in the control for correct loop corect operate:
- relevant pneumatic electronic circuit.

Diagram .testing monitoring recording resnse control

system .using appropriate fault diagnosis technical procedure

Method resolve equation ,
no phase measuring and measuring evaluation,, 1th,2th,3th,4th
Fault find low Kirchhoff: find current looking evidence circuit diagram label ..

calculation loop sum .. equation:
 $E1-E2=I1 \times R1 + I2R2 + R3I3$
 $E2-E3=I1 \times R1 + I2R2 + R3.i3$ fund knowledge value

·
_ phase step release unit competency package

Cpd: qualifications
electrotechnology
-mount and wire control equipment
Package performance,evidence requirements ,applying labelling and numbering to cables and using term number in accordance industryev, occupation health and safety ohs and works deal unplanned
procedure,select switch heard and control wiring schematic ,,

-understand electrical wiring labeling double code non metal conduct body part mean insulated conduct b gb
Indicate size gauge,b,voltage rating wire size,GB,wGbmateriaiv

Qualifications: criteria score
description tools : excellent
termination:
Learner outcome testing completed:
14-2g : two insulator ground 14,,

maximum 600volub,
- underground cable feeder inside wall if burial in ground,
- install conduit bplastic insulation,T:thermoplastic ,h eater ,w,x,nylon, synthetic,c ,rules doorbligthung ,buried PVC ,low voltage inch ,
-maintance repare planned measure instrument components ,
Diagnostic and repaired documents

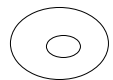
-,procedure component appropriate system. director.
Manufacture test review and approval before report .
Responsibility: originator is responsive written document .
Obtaining a DC number , priority to DRC routing
- material requirements are identify

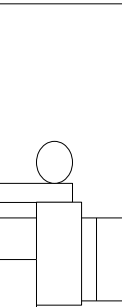
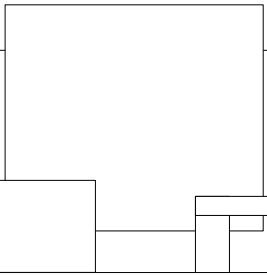
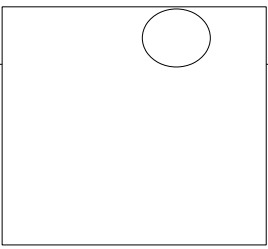
:
Description skill knowledge look for evidence confirm skills yes or not:
- checking the drawing against job requirements in accordance yes it note operating ,where appropriate procedure charter list and other applications yes or not ,refere documents,check clarity test ,operation geometry and calculation formulae,object represented in the drawing,unit of measure in presentation drawing ,action to understand in response ,material from which the object made hazard
-:base assembly drawing us identify work relationship..
-relatuoj contains.
-installatuon drawing: provide compagnj position, exposure diagram .
-Schematic assembly drawing: pictures..machine drawing

Manufacture and inspection

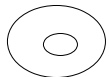
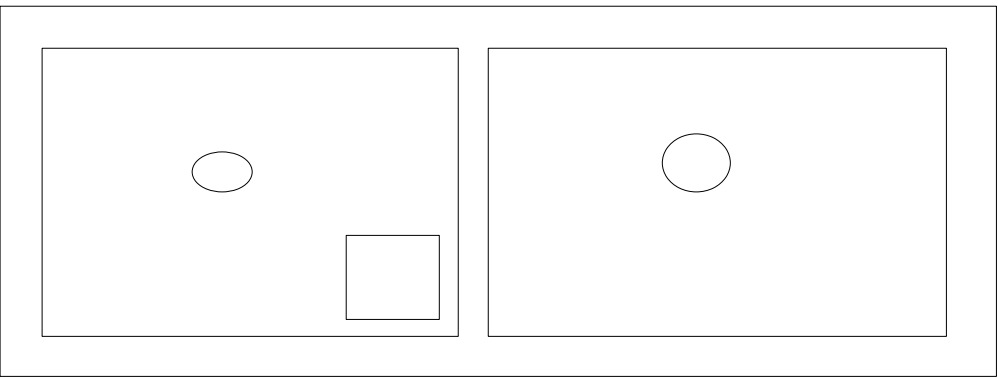
contractor final inspection nteat
quality plan document b,docuy
record and information of
inspection testing evidence
confusioning acceptance . checking
product used quality random check
listed pulling nxhexjing verifying
brequireb,shipper

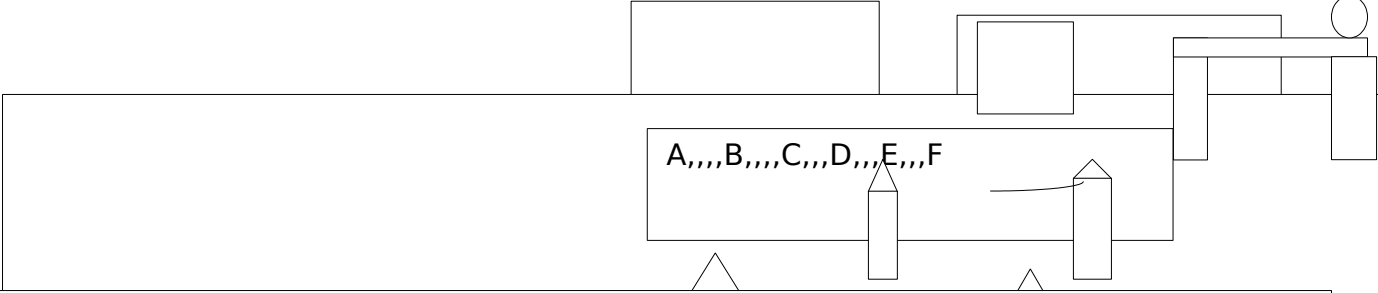
EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER , MATTER
ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,





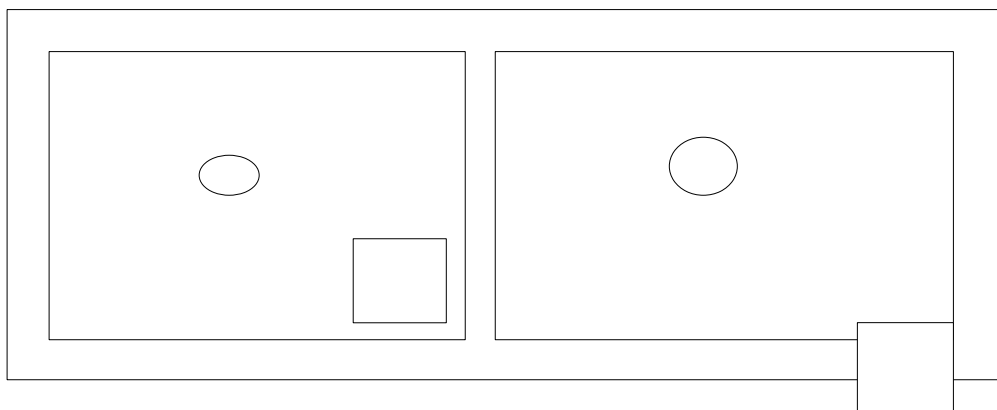
EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER , MATTER
ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,

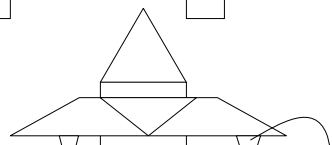
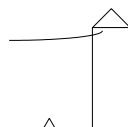
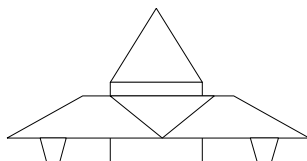
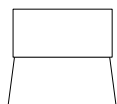




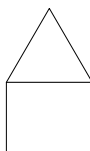
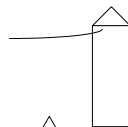
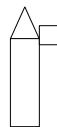
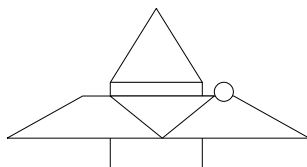
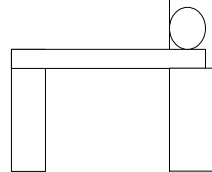
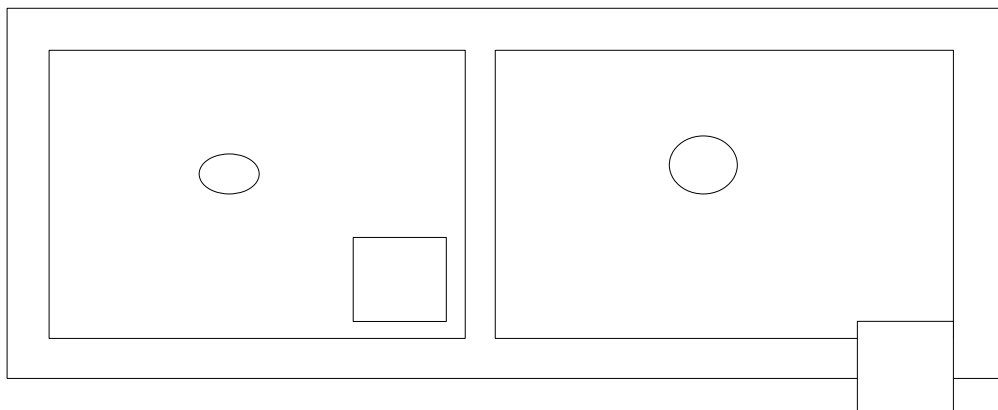
A,,,B,,,C,,,D,,,E,,,F

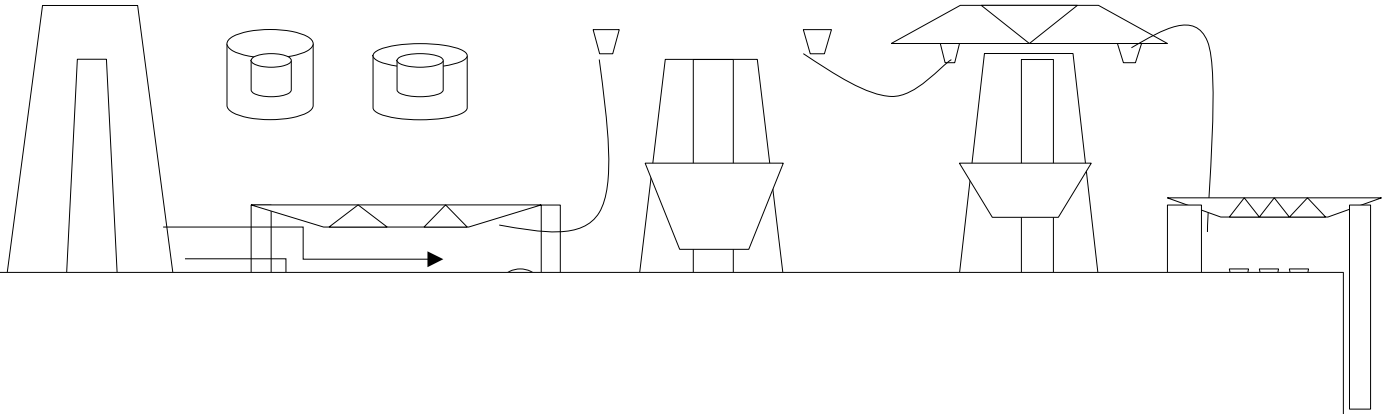
EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER , MATTER
ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,,... TRADE THEORY
ELECTRICAL . EXPLANATOR REQUIRE , CABLE SWITCH BREAKER AC , DC CURENT, HAND BASIC TOOLS ,
STEP, MASTER SKILL , MASTERING MATHEMATIVC NUMBER SKIL ALGEBRAIC , EXPONENTIAL ,
OPERATIONAL ,LOGARITH





**EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER ,
MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,
INDUSTRIEL E ELECTRONIC EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER
ENERGY WORK, HEATER , MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY
INVESTIGATION , LOAD ,,,... TRADE THEORY ELECTRICAL . EXPLANATOR REQUIRE , CABLE SWITCH
BREAKER AC , DC CURENT, HAND BASIC TOOLS , STEP, MASTER SKILL , MASTERING MATHEMATIVC**





COMPLETED VIEW WIRE WAYS TRADING SWITCH ,CONTROL SINGLE POLE, TWO WAS, TRI WAYS ,

- FUND CONTROL CORRECT , DESIGN ,
- CIRCUIT TO FOLLOW NUMBER AND WAYS
-
- **CARACTERISTIC AND SPECIFICAL POWER DESIGN**

AREA REQUIRE , AMPS, SECTION MM WIRE,

-DEVELOPMENT WIRE ,

-TABLE SHEET

- 1. SAFETY AND MANAGEMENT
- Accident prevention
- Accident prevention
- Fire protection
- Fire protection
- Risk control
- Risk control
- Project management
- Project management
- Financial management
- Financial management
- Loss control
- Loss control
- 2. ELECTRICAL TECHNOLOGY
- MECHANICAL ELECTRICAL
- Direct current machines
- Direct current machines
- Direct current generators
- Direct current generators
- Direct current motors
- Direct current motors
- Efficiency of D.C. machines
- Efficiency of D.C. machines
- Alternating voltage and current
- Alternating voltage and current
- Single and three phase circuits
- Single and three phase circuits
- Transformers
- Transformers
- Alternating windings
- Production of a rotating magnetic field
- Production of a rotating magnetic field
- Characteristics of synchronous generators and motors
- Characteristics of synchronous generators and motors
- Three phase induction motors
- Three phase induction motors
- Semi conductor devices
- Semi conductor devices
- Electric lamps and illumination
- Electric lamps and illumination
- Electric power transmission & distribution
- Electric power transmission & distribution
- Short circuit conditions
- Short circuit conditions
- Circuit breakers
- Circuit breakers
- Underground cables
- Underground cables
- Insulators Insulators
- Overhead lines
- Overhead line

- **MATERIAL EQUIPMENT AFRICAT INSTITUT POLICE ST PEACE COLLEGE REQUIRE :**

- **REQUIREMENT MANUFACTURE TRADE TRAINING TRAIN TRAINING LICENSE CERTIFICAT COMPENTENCY :**

-
-
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- **LICENSE FIRE ARM MANUFACTURE TIME TABLE : EXAMINATION TIME TABLE :**

- **CONSTRUCTION EQUIPMENT ST PEACE AND AFRICAT POLICE TIME TABLE ASSESSMENT :**

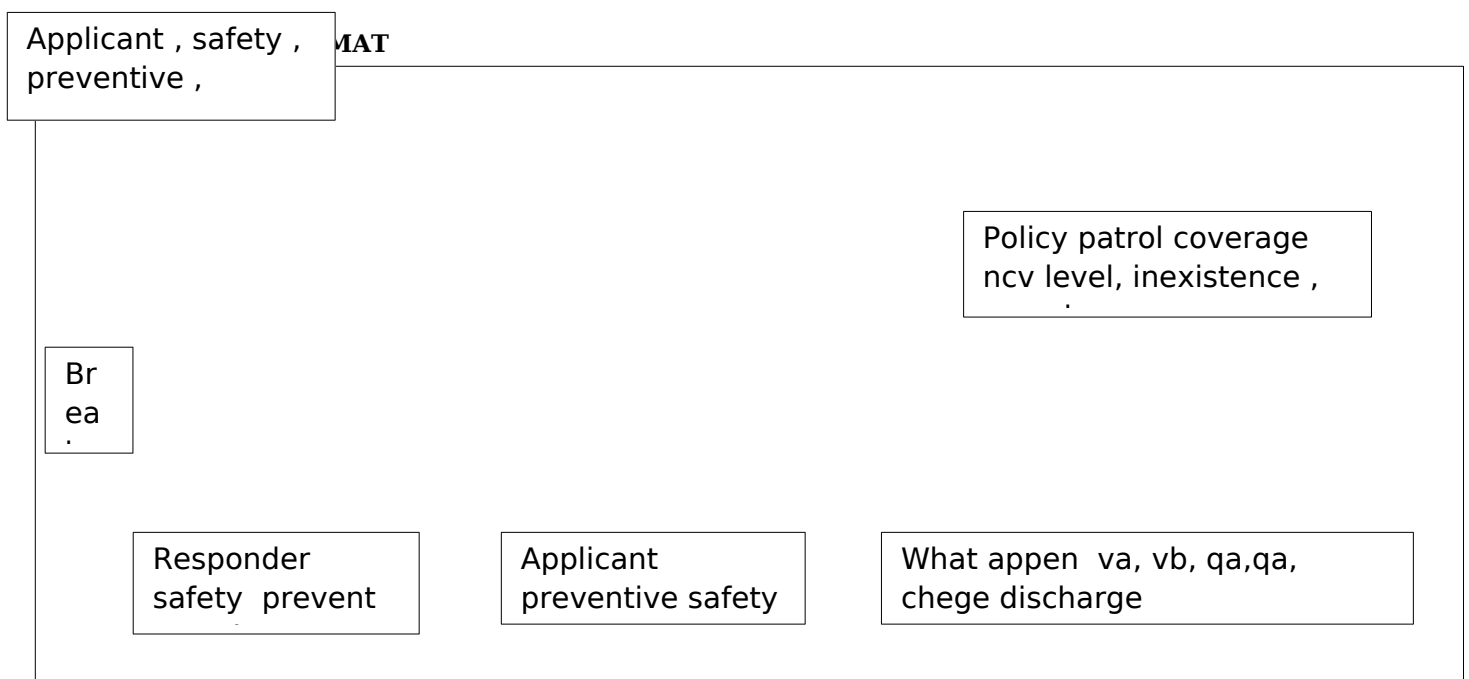
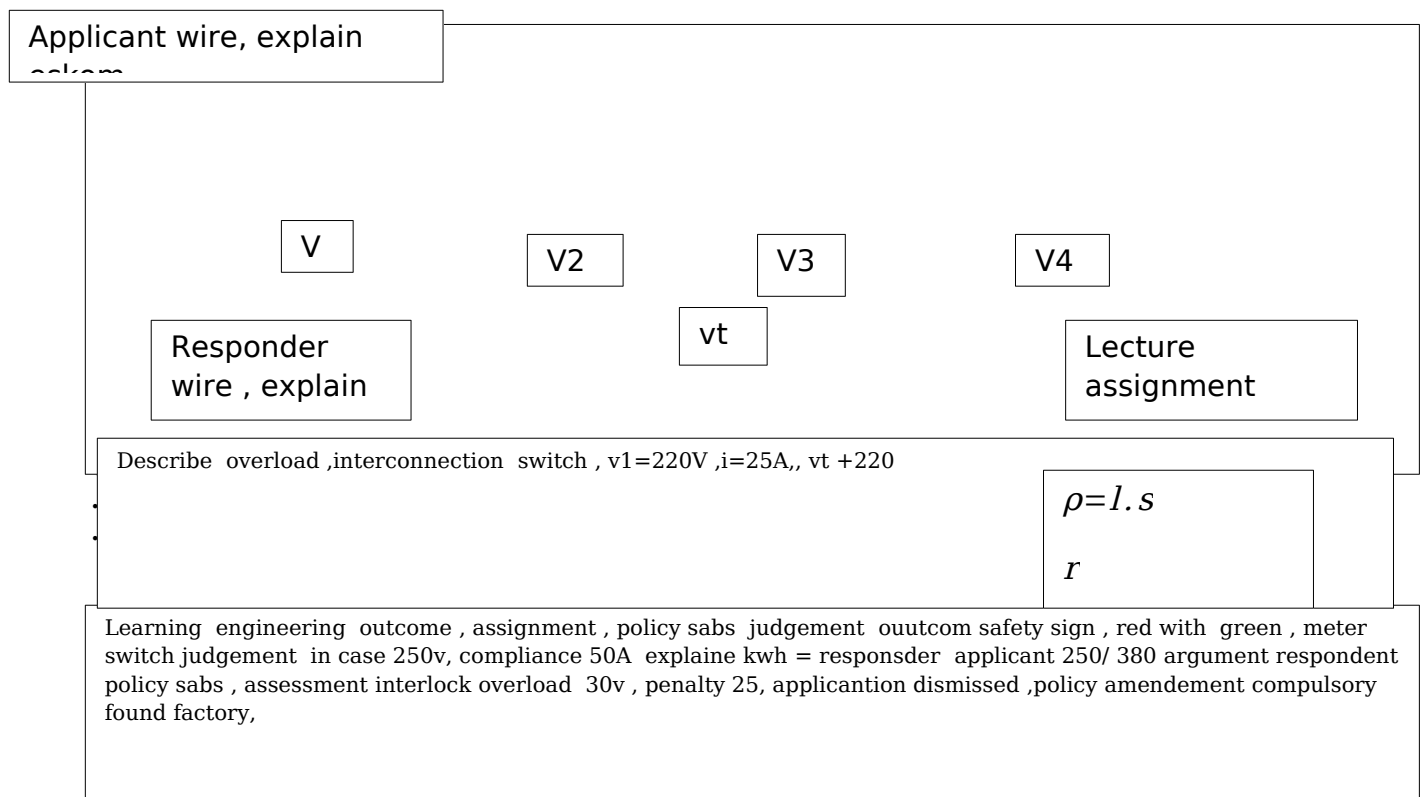
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- **OPERATIONEL STEP MANUFACTURE TRADE AND INDUSTRIEL :DAILY SUBMISSION SCHEDUL DAILY REPORT COMPLIANCE RECORD SHEET.**

- **FUNCTIONEMENT EQUIPMENT TRADE MANUFACTURE LOW TRADING , EQUIPMENT MANUFACTURE CABLER WIRE FENCING CABLE INDUSTRIEL ELECTRONICS, RELAY CONTACTOR SWITCH BREAKER CIRCUIT CCTV ALARM DETECTION CIRCUIT**

POLICE RELAY POLICE DELAY FIND FAUL WATH HAPPENDE REMOVE DIODE
TRANSISTOR POLICE GUARD ZONE POLICE DISCLAIM CLAIM TERM ELECTRONIC ,
COMPLIANCE MANUFACTURE SAFETY RULES SAFETY INSTRUMENTAL ZONE
GUARDING CCTV SECURE POLICE COMPLIANCE LOW EXPLANATORY RADIO
CONTROL RADIO FROQUENCE MONITORING VEHICLE PATROL CLOCKING

- SADF DEFENSIVE OFFENSIVE INTEGRATION SKILL DEVELOPMENT COMPENTECY FIRE
ARM GUN AMMUNITION TRADING , INTELLIGENCE SYSTEM DETECTION TRADE
THEORY SUBMISSION ANALYSE INVESTIGATION DATA EXAMINATION ,



CHIEF MARKET.....
AWARD MARKING TIME 1TSH,

MEETING REQUIREMENT, EXPLANATORY TSHINGOMBE TSHITADI FISTON

QUESTION PAPPER ST PEACE COLLEGE, REPORT SUBJECT TIME TABLE
COMPLEMENTAIRY SUPLEMENTAIRY

LEARNING: BUSINESS ENGLISH N3 MATRIC : BY LEARNER KEKE SUBMISSION
MARK MEMO

: BASIC ENGLISH LEARNER GRADE 12 AND HIGH LEVEL

HIGH GRADUAT BASIC LANGUAGE TRANSLATE AFRICANSE , EDUCATIONEL
WRITE STATEMENT COMMUNICATION; BY SMILL QUOTAION ORAL
PRESENTATION

DISTANCE UNIVERSITY : LEARNING TUTORIAL UNISA CAPS PLATINUM: by CONIE
MANAGEMENT EDUCATOR

ASSESSEMENT AFRICA INSTITUT POLICE POES, PRESENTATION ORAL TEXTBOOK
N1, N2, N3

QUESTION: FIND INVESTIGATION ANALYSE

1. EXAMINATORY QUESTION PAPPER TOPIC?
2. COVER LETTER CV, QUESTION PAPPERS SELF BUSINESS
3. REQUEST LETTER, TOPIC ?
4. COMPAGNY SUPPLY LEARNING?
5. RWONG MODEL?
6. NOTICE?
7. FILING SUBMISSION ?
8. BASIC ENGLISH AND BASIC ENGLISH COMMMAND EXCLAMATORY
9. CORRECTIONAL PAPPER SCHEDUL ERROR , Point FULL STOP, EXPRESSION LOGIC LANGUAGE RWITEN

ANSWERING COMPLETED TEXTBOOK, criterion test module completed? 10 mark

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Workshop lab table completed: library bibliotheca case book explanatory merge line

Question :

textbook report ,

subject ,

sib ,

author

Report occurred

.....
.....
.....

Work shop documentation id booking practice school college library // 10 mark

1. Documentation book?
2. Filing book?
3. Review book page summary topic?
4. Correct edition book?
5. Published booking?
6. Text booking material?
7. Writing id book copy book exercise book, stationary book,
8. Class work practice student practice, teacher completed daily practice?
9. Student complete notebook completed textbook exercise self assignment self assessment?
10. Student completed portfolio, teacher completed portfolio educator?
11. Creation merge line imagine thing word letter?
12. Practice student card registrar practice id number completed time in time out school time daily policy ?school practice code rules conduce school student card id student registrar order number student,
13. Practice files student marketing mark memorandum business filing student employer up dating up grading?
14. filing step write skill development system student intelligence system step flick student office
15. filing student , amount school fee credit accreditation cash order debit student accommodation filing allowance filing record reward cash order filing school library sale returned permit photocopy project, ?copyright privacy, order cancellation case ordering student. ?
16.
17. Filing student disclose advice affidavit claim fire script inspector student copyright inspector debugger catch try , policy sector education finding style editor performance claim correct database analyze completed , model ?
18. Verification filing checking assessment checking allocation checking time table supplementary complementary student across examination , yes or not subject if not give evidence , and relate conflict degree, ?
19. Practice student critical experimental textbook practice work shop lab electrical engineering summative formative criterion assessment?
20. trade theory electrical experimental trading module subject ; job trade observation fault find module --coverage example .assessment practical trade misted book answering discovery report module calling relay contactor switch gear meager circuit breaker , earthling , motor dc, motor ac current dc current, alternating, switch wire premise wire ways sibs sans 10142 , stipule technical engineering electrical asking true or fault , require component , operational component fault find construction , advantage big more smallest disvantage size consumerexplanatory explain demonstration knowledge equation trading cost award price experimental job strike job matter operational step technical refund or found system process , remanufacture 5 years exchange policy coverage

maintenance daily meeting policy breakdown cleaning equipment skill maintaining, creation hand tools creation ?

21. **Industrial electronics** , electrical basic , electronic basic operational diode transistor thruster, resistance condensate, field magnetic electromagnetic experimental trading module subject ; job trade observation fault find module --coverage example .assessment practical trade misted book answering discovery report module calling relay contactor switch gear meager circuit breaker , earthling , motor dc, motor ac current dc current, alternating, switch wire premise wire ways sibs sans 10142 , stipule technical engineering electrical asking true or fault , require component , operational component fault find construction , advantage big more smallest disvantage size consumerexplanatory explain demonstration knowledge equation trading cost award price experimental job strike job matter operational step technical refund or found system process , remanufacture 5 years exchange policy coverage maintenance daily meeting policy breakdown cleaning equipment skill maintaining, creation hand tools creation , industrial transformer using company society ? 10 mark

22. **Engineering science** ,analyze discovery investigate ,module static, kinetic , heater hydraulic power , energy experimental trading module subject ; job trade observation fault find module --coverage example .assessment practical trade misted book answering discovery report module calling relay contactor switch gear meager circuit breaker , earthling , motor dc, motor ac current dc current, alternating, switch wire premise wire ways sabs sans 10142 , stipule technical engineering electrical asking true or fault , require component , operational component fault find construction , advantage big more smallest disvantage size consumerexplanatory explain demonstration knowledge equation trading cost award price experimental job strike job matter operational step technical refund or found system process , remanufacture 5 years exchange policy coverage maintenance daily meeting policy breakdown cleaning equipment skill maintaining, creation hand tools creation ? 10 mark

23. **Drawing engineering** , analyze fundamental investigate creation, module, isometric, free hand, join type sibs sans require ruling experimental trading module subject ; job trade observation fault find module --coverage example .assessment practical trade misted book answering discovery report

$$E1 = e_m \sin \omega t$$

$$E2 = k_2 \cdot e_m \cdot \sin^2 \omega t$$

$$E3 = k_3 \cdot e_m \cdot \sin^3 \omega t$$

$$E_n = k_n \cdot e_m \cdot \sin^n \omega t,$$

$$E = e_1 + e_2 + e_3 + \dots + e_n$$

$$I_1 = 45 \times 10^{-3} \sin 127t$$

$$I_2 = 22,5 \times 10^{-3} \sin 3770t$$

$$I_3 = 15 \times 10^{-3} \sin 7540t,$$

$$I_1 = 45 \times 10^{-3} \sin 120t$$

$$I = 45 \times 10^{-3} \sin 127t + 0,5 \sin 3770t + 0,33 \sin$$

$$i_1, i_n + i_1 + i_2 + i_3 = 0$$

$$E = v - i_a \cdot r_a$$

$$N = v - i_a \cdot r_a / k \emptyset$$

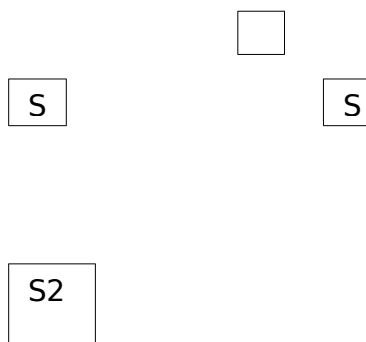
stipule technical engineering electrical asking true or fault , require
 compone operational component fault find construction , advantage big
 more sma 1 disvantage size consumerexplanatory explain demonstration
 knowledge , uation trading cost award price experimental job strike job matter
 operation tep technical refund or found system process , remanufacture 5
 years exc 2 ie policy coverage maintenance daily meeting policy breakdown
 cleaning ment skill maintaining creation hand tools creation ?

Tutorial: lecture ,basic subject posted , tutee guarding explainer , teacher ,institutur , instructor memorandum , exam,
 charted , explain , educator tech , technologies , tutorial register ,

Proof, post grade tutor learning engineering,

a

-consultant , doctoral analyze operator , activity module, symptom, le assess , assign did act activity diagnostic
 symptom ,learning assess didactic discipline educe tech no logic task ,permit license authorization building educator technology
 allocation control,



x	y					
S1	S2	S1	S2	S1.s 2	S1.s 2	I
0	0	0	0	0	0	
1	0	0	0	0	0	
1	1	0	0	0	0	
1	1	1	0	0	0	
1	1	1	1	1	1	

Logic system,calcul numeric, ,psychotic proof, simplify fraction ,switch contact, algebraic ,,x proposition power
 n variable x, n proposition , conversion binary, base binary decimal hexadecimal, ,logarithm diagram sequential,
 , s1. S2, switch , rectifie, amplificatory, outcome modules, equation switch ,simplify binary switch 0.1.state

- Specification material characteristic material wire size mass cabling board table completed ,

x^n ,, y^n ,,, $\log_{10} 100$, , 10 base 2 = 100 conversion binary , decimal , 10 /2 found 0,0,1 switch , reason proof ,,

Switch exponential proof $\log_2 2 = 4$, log 2 base 4 , ,, sequence $a_n = a_n + 1$, psychometric variable or psychotic proof progression geometric arithmetic ,

$Ax+b=0$

$Ax_1+b_2=0$,,, equation $ax_1+b_1=ax_2+b$

$Ax+b-b=ax_2$,

Tr
dra

Mc
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Ec

X-

x+

x+

=8 ,

Proof equation mental reasoning

Recalculate error, systematic, methodic, means

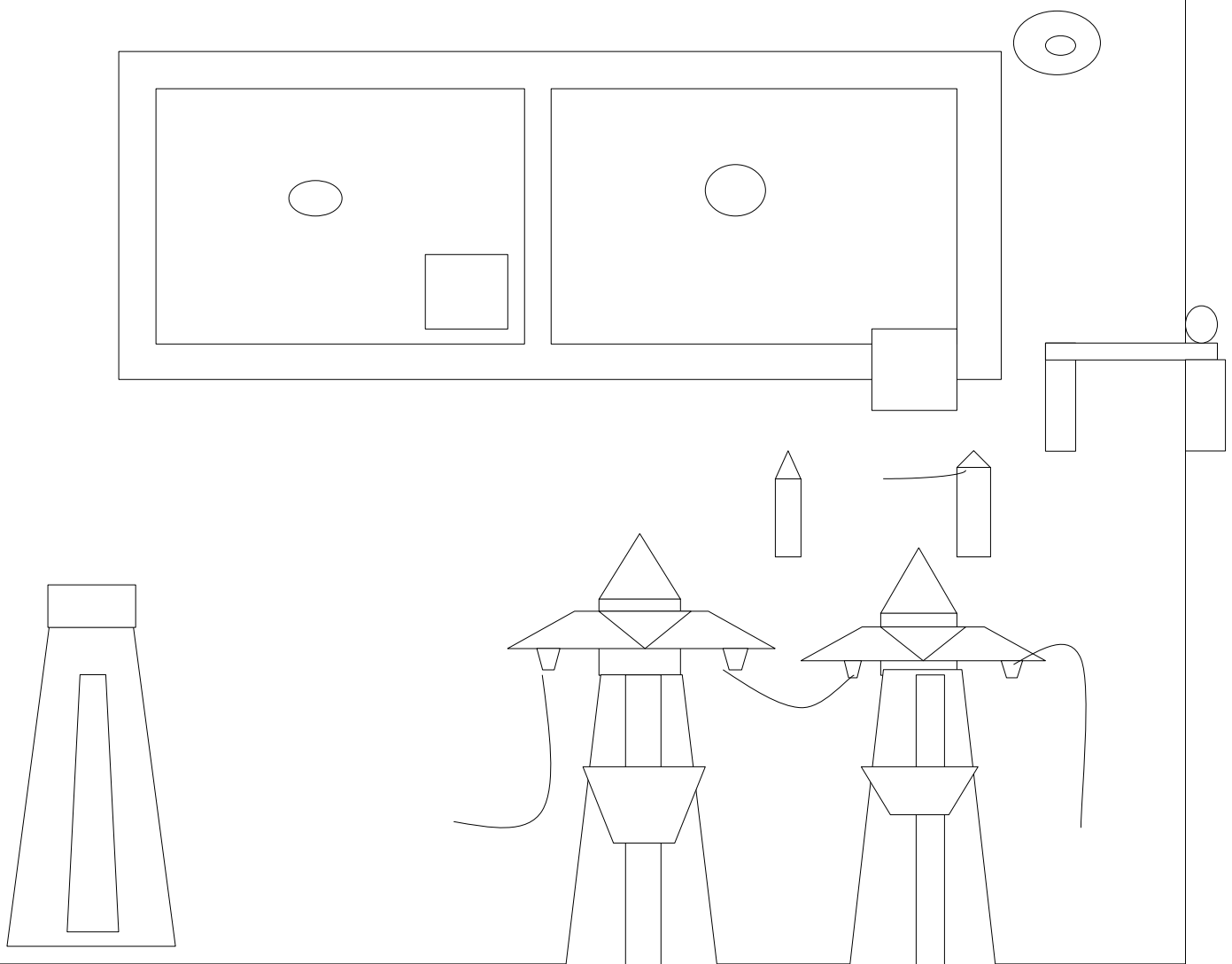
$8+4=12$

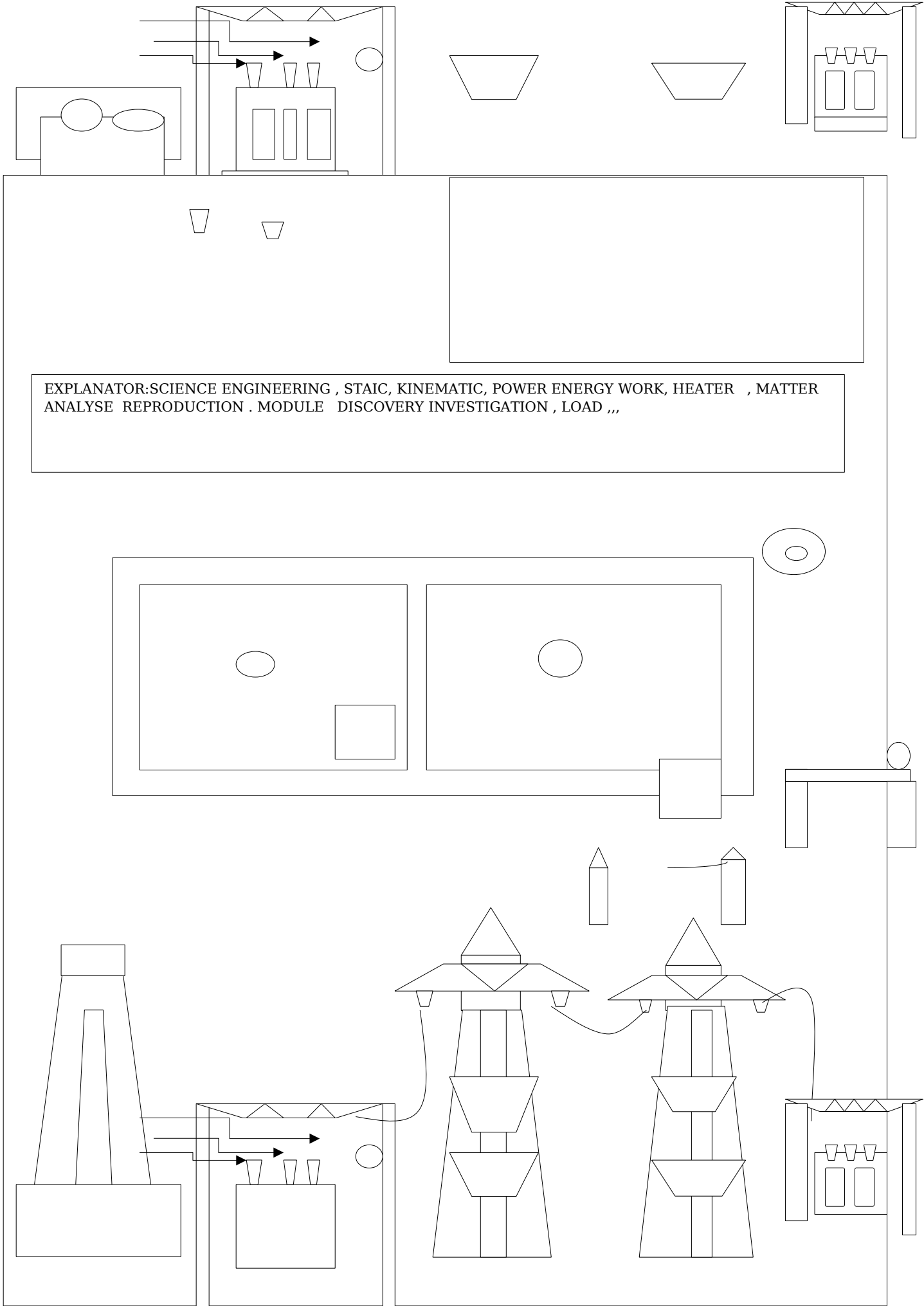
$12=12$, proof number mastering counting equation

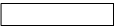
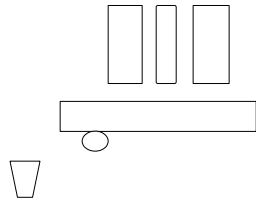
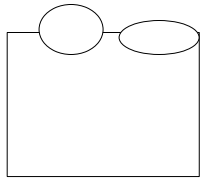
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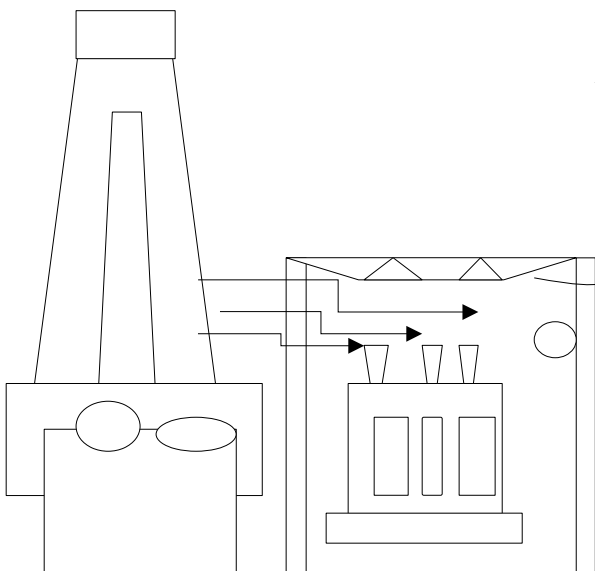
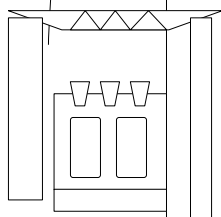
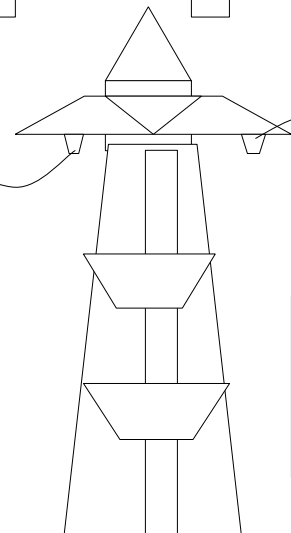
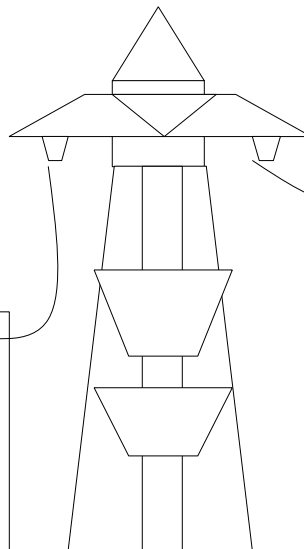
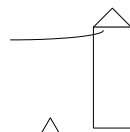
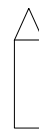
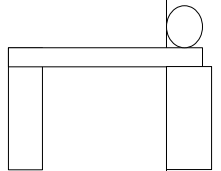
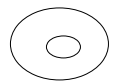
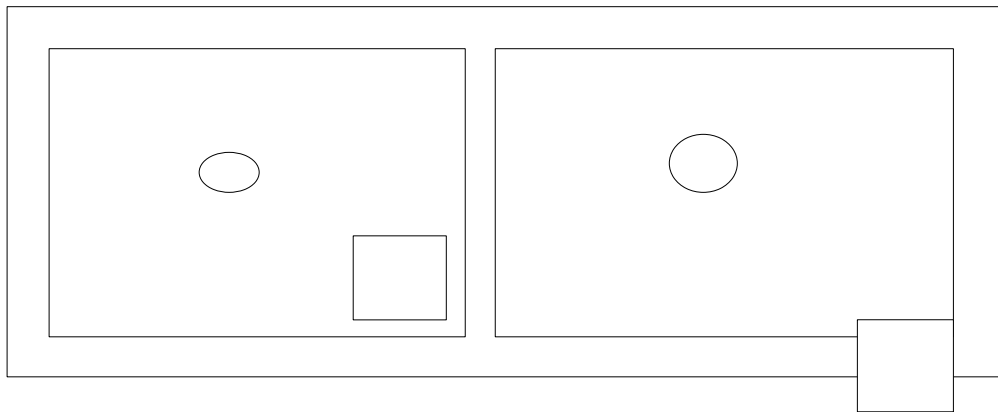
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ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,





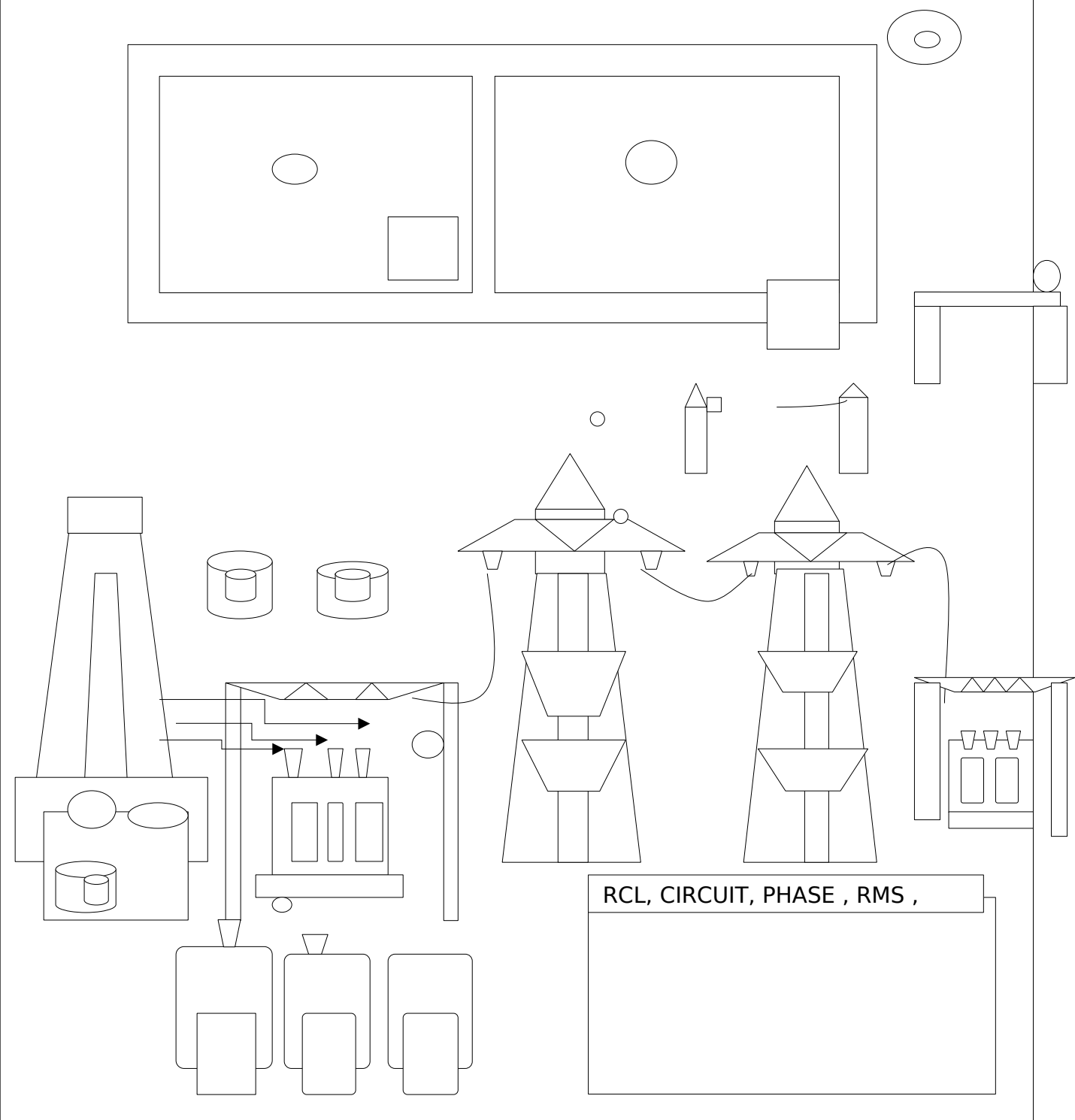


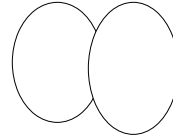
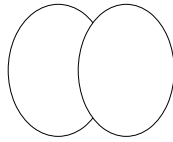
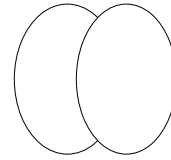
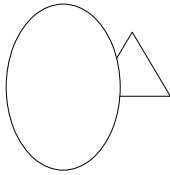
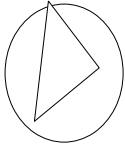
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QUESTION

**EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER ,
MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,
INDUSTRIEL E ELECTRONIC EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER
ENERGY WORK, HEATER , MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY
INVESTIGATION , LOAD ,,,,... TRADE THEORY ELECTRICAL . EXPLANATOR REQUIRE , CABLE SWITCH
BREAKER AC , DC CURENT, HAND BASIC TOOLS , STEP, MASTER SKILL , MASTERING MATHEMATIVC**





COMPLETED ENGINEERING , EXPLANATORY , REQUIREMENT WIRE ,

CARACTERISTIC . SPECIFICATION

- POWER MAXIMUM ALLOWED

- POWER APPARENT, TRUE POWER FACTOR,

- ENERGY DEMAND MANAGEMENT LOAD, OVERHED MAIN CIRCUIT BREAKER,

CONSTRUCTION ,....

OPERATIONEL CIRCUIT ,

NUMBER PYLONE , , HEIGTH PYLONE , VALUE NUMBER VOLTAGE LINE MASTERING :

DESCRIBE COMPONENT, DEMONSTRAION REQUIREMENT ,

VALUE AVERAGE , RMS, INSTATANOUSE, CIRCUIT,

-COMPLETE DESIGN STRUCTURE..

Applicant wire, explain

20/06/2020

V

V2

V3

V4

Responder
wire , explain

vt

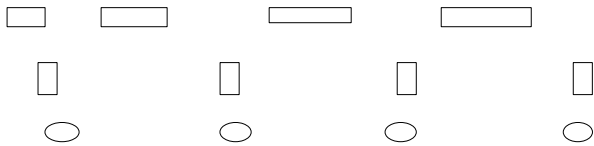
Lecture
assignment

Describe overload ,interconnection switch , v1=220V ,i=25A,, vt +220

$\rho = l \cdot s$
 r

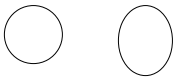
Learning engineering outcome , assignment , policy sabs judgement ouutcom safety sign , red with green , meter switch judgement in case 250v, compliance 50A explaine kwh = responsder applicant 250/ 380 argument respondent policy sabs , assessment interlock overload 30v , penalty 25, applicantion dismissed ,policy amendement compulsory found factory,

Applicant , safety ,
preventive ,



Policy patrol coverage
ncv level, inexistence ,
.

Br
ea
.



Responder
safety prevent

Applicant
preventive safety

What appen va, vb, qa,qa,
chege discharge

Coverage enclose policy safety portofolio log inspection equipment earth , device , tested regularly , log book missing covers, base connection ,over load , short circuit protection device, founding earth leave judgement , conductor high power reason over power submission,

D1

Solution $R_0 = 65 \text{ ohms}$, $t = 0^\circ \text{C}$, $R_t = ?$ $\alpha = 0,0042$, degree, $R_t = R_0 (1 + \alpha \Delta t)$, $= 65 (1 + 0,0042 \times 70)$
 $= 84$

, 47 ohms.

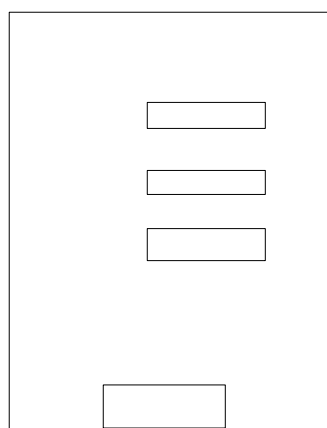
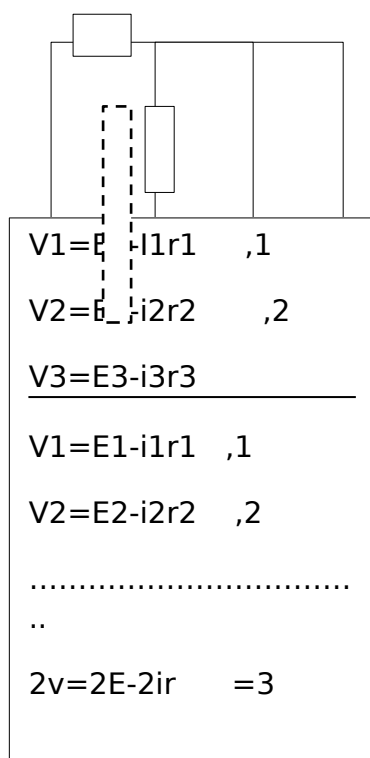
- The field coil of motor has resistance of 20 ohms at 0 degree calculate resistance of the coil at 36 degrees if the temperature coefficient resistance of copper is 0,00426 degree at 0 degrees, at, $R_0 = 20 \text{ HOHM}$, $T_0 = 0^\circ \text{C}$, $T_1 = 36^\circ \text{C}$, $R_t = 20(1 + 0,00426 \times 36)$, $= 20 \times 1,15336 = 23,07 \text{ ohm}$,
- A field? coil, made of copper wire, for a dc motor has a resistance 50 ohm at 0 degree Celsius, calculate the resistance at 60 degree celcius if the temperature coefficient of resistance of copper is 0,00426 /degree
- At 0 degree, $R_0 = 50 \text{ ohm}$, $t_0 = 0^\circ \text{C}$, $t_1 = 60^\circ \text{C}$, $R_t = 50(1 + 0,00426 \times 60)$
- $= 50(1 + 0,2556)$, $= 50 \times 1,2213 = 50 \times 1,02556$, $R_t = 50 + 50 \times 0 = 62,78$
- Coil of wire has a resistance of 120 ohms at 0 degree calculate the resistance of 0,00061 at 0 degree
- A 220 VOLT ELECTRIC HEATER RATED. at 1,6 kw determine,
- The current that it would draw from the supply and 7,27 a,
- The resistance of the heating element
- $I = \frac{P}{V}$, $i = 1,6/220 = 7,27$, $r = V/I = 220/7,27 = 30,26$
- When a 12 volt lamp is connected across the correct supply voltage its power consumption is 60 watts determine the rated
- The rated current and, $= 60/12 = 5 \text{ A}$,
- The resistance of the filament $R = 12/5 = 2,4$

A lamp filament has resistance of 121 ohms and draws a current of 0,91 ampere when connected across a certain supply determine,

The power consumed by the lamp and 100,2w

The supply voltage, $v = rxi$ ($121 \times 0,91$) = 110, 11

$P = 110 \times 0,91 = 100,2$



$$1/r = 1/r1 + 1/r2 =$$

$$ET = nxe1$$

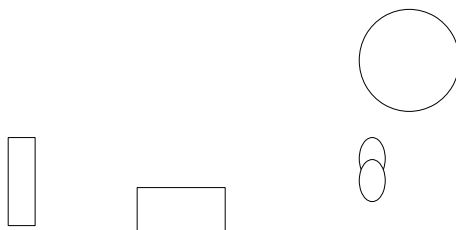
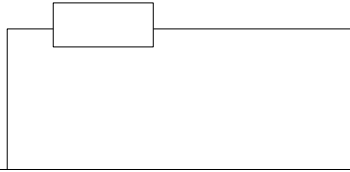
$$Rt = nxr1$$

$$I = E/R + r =$$

$$= 6/3,42 + 1,6 = 1,193 \text{ A,}$$

$$-v = E - ri = 6 - 1,193 \times 6 = 4,09$$

Log



$$E=v+ir$$

12v

12v

I1

I2

I3

Proof, $v=e-ir$

$$2v=4v-i2 \text{ ohm}$$

$$2v/4v=4v-i2/4v$$

$$1/2v=-i2/2 \text{ ohm}$$

$$1=1$$

Research current , passed circuit resistor , r1,r2, circuit total
circuit , 3month kwh meter certify consumer power , efficient
work done , 3month 6 years , guarantee

French / graduate

$$2v=4v-i_2$$

$$4v=2-I\ 2ohm$$

$$6v=2v-4x2\ ohm$$

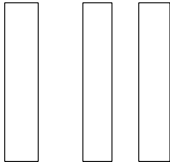
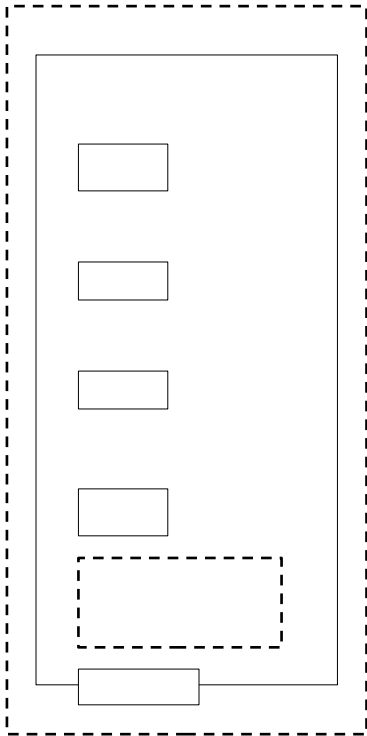
.....

$$2v_1=4v-i_2ohm\ ,\ 1.$$

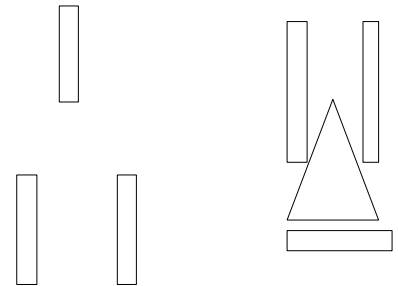
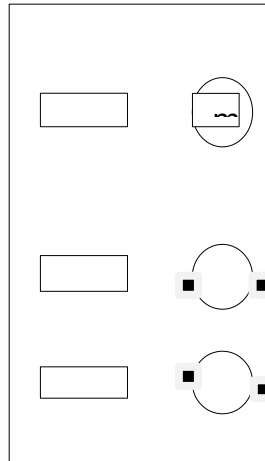
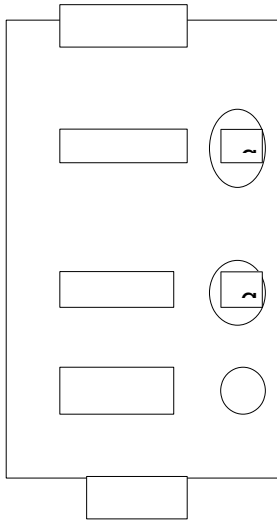
$$4v_2=2v-i_2\ x2\ \ 2$$

.....

$$2v_2 = 6v-i.4\ (40$$



Give two equation which can be use to determine the internal, research current circuit, r_1 , r_2 , connected paralle, passed, if $i_2=2a$, $i_3=3a$, $i_4=6a$, it periode, 3month power,



$$V_L = \sqrt{3} V_F,$$

$$V_L = V_F$$

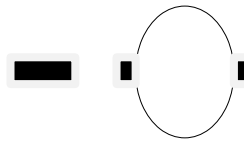
$$I_f = I_f$$

$$I_L = \sqrt{3} \cdot I_f$$

$$V_1 = E_1 - I_1 z_1, \dots, 1$$

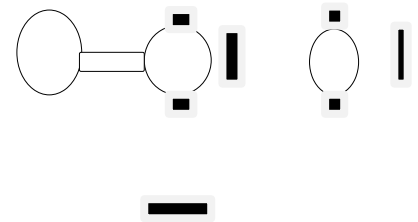
$$V_2 = E_2 - I_2 z_2, \dots, 2$$

$$V_3 = E_3 - I_3 z_3, \dots, 3$$



$$E = v - i a \cdot r_a$$

$$N = v - i a \cdot r_a / k \varnothing$$



$$E_1 = e_m \sin \omega t$$

$$E_2 = k_2 \cdot e_m \cdot \sin 2 \omega t$$

$$E_3 = k_3 \cdot e_m \cdot \sin 3 \omega t$$

$$E_n = k_n \cdot e_m \cdot \sin n \cdot \omega t,$$

$$E = e_1 + e_2 + e_3 + \dots e_n$$

$$I_1 = 45 \times 10^{-3} \sin 127 t$$

$$I_2 = 22,5 \times 10^{-3} \sin 3770 t$$

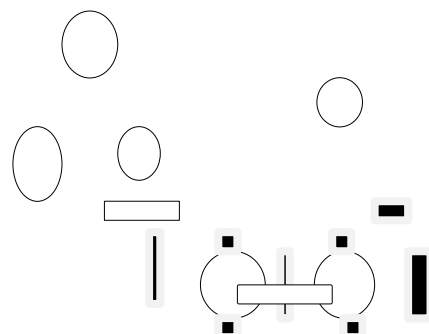
$$I_3 = 15 \times 10^{-3} \sin 7540 t,$$

$$I_1 = 45 \times 10^{-3} \sin 120 t$$

$$I = 45 \times 10^{-3} \sin 127 t + 0,5 \sin 3770 t + 0,33 \sin 7540 t$$

$$i_1, i_n + i_1 + i_2 + i_3 = 0$$

a



Tutorial: lecture ,basic subject posted , tutee guarding explainer , teacher ,institutur , instructor memorandum , exam, charted , explain , educator tech , technologies , tutorial register ,

Proof, post grade tutor learning engineering,

-consultant , doctoral analyze operator , activity module, symptom, learn assess , assign did act activity diagnostic

Translate French English level , math teacher , educator technology , educator technique , psychotic calculus mental measure drawing , master skill proof , explain low give evidence low quotation low, dividend low, correct low ,

Motion note teacher grade 12,n3 metric 1, month , 3month 60 day kmh 3month , caps curriculum policy assessment, , exchange certificate policy . Proof enclose, coverage graphic


Equation



$X+4=12$

$x+4-4=12-4$

$x+0=8$

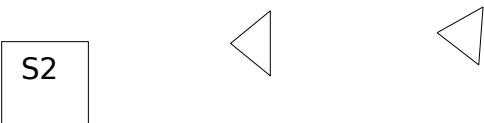
$=8$,

Proof equation  reasoning

Recalculate  r, systematic, methodic,  ans

$8+4=12$

$12=12$, proof number mastering counting equation



x	y					
S1	S2	S1	S2	S1.s 2	S1.s 2	l
0	0	0	0	0	0	
1	0	0	0	0	0	
1	1	0	0	0	0	
1	1	1	0	0	0	
1	1	1	1	1	1	

Logic system,calcul numeric, ,psychotic proof, simplify fraction ,switch contact, algebraic ,,x proposition power n variable x, n proposition , conversion binary, base binary decimal hexadecimal, ,logarithm diagram sequential, , s1. S2, switch , rectifie, amplificatory, outcome modules, equation switch ,simplify binary switch 0.1.state

x^n ,, y^n ,,, $\log_{10}100$, , 10 base 2 = 100 conversion binary , decimal , 10 /2 found 0,0,1 switch , reason proof ,,

Switch exponential proof $\log_22=4$, $\log 2$ base 4 , ,, sequence $a_n = a_{n+1}$, psychometric variable or psychotic proof progression geometric arithmetic ,

$Ax+b=0$

$Ax_1+b_2=0$,,, equation $ax_1+b_1=ax_2+b$

$Ax+b-b=ax_2$,

QUESTION EXPLANATORY

REQUIRE AND OPERATIONAL

- **CONSTRUCTION GRAND TO**
- **COUNCIL ENGINEERING DIPLOMA COMPLETED**

□ □ □

$$(a+b)=a^2+2b+b^2,$$

Close, enclose proof,

$$a=x-4=12$$

$$b=x-6=6$$

Simplify. Proof

$$3x. y.2$$

$$X=1$$

$$Y=1$$

$$=3(1).(1)$$

$$3 \times 2 = 6 \text{ proof number mastering}$$

UNITY STATEMENT , AWARD MARKING, RE- MARKING FIND	COMPLI EXPLAN COMPON -ANALYS -MASTER TABLE REPRODUCTION PROJECTION ENGINEERING	VERIFICATION NCV, -MILITAIRE INTELLIGENCE COMMUNICATION SYSTEM FOUNDATION
<ul style="list-style-type: none"> • COUNCIL ENGINEERING DIPLOMAT , AWARD DEGREE, HIGHER GRADUAT. <hr/> TECHNIKON COURSE NATIONAL DIPLOMA 1st N ENGINEERING MECHANICAL AND ELECTRICAL ENGINEERING T1 Electrical Engineering (M) (E) T1 Engineering Mathematics (M) (E) T1 Engineering Mechanics (M) (E) T1 Machine Drawing (M) (E) T1 T2 Electronics (E) T2 T3 Electrotechnology (E) T3 Mechanical Technology (M) T3 T4 Applied Thermodynamics (M) T4 Fluid Mechanics (M) T4 Mechanics of Machines		

<p>(M) T1 Strength of Materials (M)(E) T4 Electrical Engineering (h.c) (E) T4 Electrical Machines (E) T4 Industrial Electronics (E) T4 CONVERSION COURSE To enable holders of the Mechanical Certificate of Competency to qualify for the Electrical Certificate of Competency or vice versa: Electrical Engineering (h.c) (M) T4 Electrical Machines (M) T4 Applied Thermodynamics (E) T4 Fluid Mechanics (E) T4 (M) - Mechanical 'Engineering (E) - Electrical Engineering (h.c.) - Heavy Current The subjects shown are only the highest levels to be attained. All the grades leading to that level must also be attained with a 50% pass mark (e.g. Strength of Materials T4 includes a pass in this subject on T2 and T3 levels) NOTE: Each candidate following this route to obtain a Certificate of Competency must provide documentation to prove that: (i) he has followed a "sandwich" course (i.e. one semester practical training - one semester classes, alternating at a Technikon), and (ii) that the syllabus in Annexure IV is included in the extended Technikon curriculum. ANNEXURE III TECHNICAL COLLEGE COURSE MECHANICAL AND ELECTRICAL ENGINEERING N3 Engineering Drawing (M)(E) N3 N4 Engineering Science (M)(E) N4 Industrial Electronics (M) N4 Mathematics (M)(E) N4 N5 Electrotechnics (M) N5 Strength of Materials (E) N5 N6 Control Systems (M)(E) N6 Mechanotechnics (M)(E) N6</p>		
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<p> Power Machines (M)(E) N6 Strength of Materials (M) N6 Fluid Mechanics (M) N6 Industrial Electronics (E) N6 Electrotechnics (e) N6 Supervision (M)(E) N6 CONVERSION COURSE To enable holders of the Mechanical Certificate of Competency to qualify for the Electrical Certificate of Competency and vice versa. Electrotechnics (M) N6 Industrial Electronics (M) N6 Strength of Materials (E) N6 Fluid Mechanics (E) N6 (M) - Mechanical Engineering (E) - Electrical Engineering (heavy current) The subjects shown here are only the highest levels to be attained. All the grades leading to that level must also be attained with a 50% pass mark (e.g. Electrotechnics N6 includes a pass in this subject on the N3, N4 and N5 levels) ANNEXURE IV (a) SYLLABUS FOR PLANT ENGINEERING . (From June 1993 Examination) THE THEORETICAL SECTION OF THE SUBJECT PLANT ENGINEERING TO BE TAUGHT BY TECHNIKONS AND TECHNICAL COLLEGES Questions will be framed on all aspects of the theory and the prac tical application of such theory in its widest sense as would be expected of a certificated engineer while performing his normal duties. Accent is placed on his competency in the execution, control and supervision of the safe installation, maintenance and operation of machinery SYLLABUS FOR PLANT ENGINEERING MECHANICAL ELECTRICAL 1. SAFETY AND MANAGEMENT Accident prevention Accident prevention Fire protection Fire protection Risk control Risk control Project management Project management Financial management Financial management </p>		
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Loss control Loss control 2. ELECTRICAL TECHNOLOGY MECHANICAL ELECTRICAL Direct current machines Direct current machines Direct current generators Direct current generators Direct current motors Direct current motors Efficiency of D.C. machines Efficiency of D.C. machines Alternating voltage and current Alternating voltage and current Single and three phase circuits Single and three phase circuits Transformers Transformers Alternating windings Production of a rotating magnetic field Production of a rotating magnetic field Characteristics of synchronous generators and motors Characteristics of synchronous generators and motors Three phase induction motors Three phase induction motors Semi conductor devices Semi conductor devices Electric lamps and illumination Electric lamps and illumination Electric power transmission & distribution Electric power transmission & distribution Short circuit conditions Short circuit conditions Circuit breakers Circuit breakers Underground cables Underground cables Insulators Insulators Overhead lines Overhead line		

QUESTION, TOPIC EXPLANATORY OUTCOM SUMMARY, EVALUATION CRITERION MODULE ,

TEST CRITERION ,1,2,3 OUTCOM EXPLANATOR LEVEL COMPLETED . SHEET TABLE

TRADE THEORY ELECTRICAL <ul style="list-style-type: none"> - INDUSTRIE - ELECTRON - IC - SCIENCE - ENGINEERI - NG - DRAWING - ENGINEERI - NG - MATHEMAT - IC - 				
REQUIREMENT . <ul style="list-style-type: none"> - BASIC - ADVANCEE - D - FILING 	CONSTRUCTION <ul style="list-style-type: none"> - CONSRUCT - ELECTRIC - TECHNOLOGY - ELECTRIC,MECH - ANIC - ELECTROTECHNI - ELECTROTECHN - OLO 	OPERATIONAL STEP,	FUNCTION	POLICY SECURITY SAFETY , SETA , MERSETA EXCHANGE DAILY MEETING MAINTENA NCE , ERGONOM TEACHER INVESTIGAT E,
1- CABLING TOOLS HAND SAFETY PREMISE SANS SABS ,EIC, CEBEC WIRING POWER FACTOR MAXIMUM ALLOWED CABLE 5% CIF SWITCHBREAKERS CONTACTOR RELAY DELAY MOTOR DC SERIE MOTOR , SHUNT MOTOR EXCITATAION				Circuit breakers Circuit breakers Undergroun d cables Undergroun d cables Insulators Insulators Overhead lines Overhead line

COMPOUND , MOTOR AC EARTHING TRANSFORMER MAXIMUM DEMANDE				
ELECTRONIC DIOD E TRANSISTOR CIRCUIT TYRISTOR				
MASTERING SKILL DISCOVERY ,HANDING HOVER QUESTION WATH HAPPENED FIND FAULT DEVICE PROTECTION INSTALLER RULES, STRENGTH MATERIAL,				
INDUSTRIEL ELECTRONIC - ELECTRICIT Y BASIC - ELECTROST AIC,FIEL, - ELECTROM AGNETIC , - KIRICHOFF - NORTON THEVENIN - RESISTANC E HOM LOW, - CONDENSA TOR, COIL, AC CURRENT RMS .FACT OR FORM , PHASOR DIODE TRANSISTO R SYCHHRON ISATOR INSTRUME NT MEASURE ADDED RESISTANC E SHUNT,				
WIRING PRACTICAL MASTERING				

INDUSTRIEL,				
DRAWING TABLET SCIENCE ENGINEERING ANALYSE DISCOVERY CRITICAL TIME TABLE EVALUATION STAIC, KINEMATIC, POWER ENERGY WORK, HEATER , MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,, INDUSTRIEL E ELECTRONIC EXPLANATOR:SCIENCE ENGINEERING , STAIC, KINEMATIC, POWER ENERGY WORK, HEATER , MATTER ANALYSE REPRODUCTION . MODULE DISCOVERY INVESTIGATION , LOAD ,,,,, TRADE THEORY ELECTRICAL . EXPLANATOR REQUIRE , CABLE SWITCH BREAKER AC , DC				

EXAM PAPPER , TRAINING CENTER , OUTCOM EXPLANATOR

EXAM PAPPER TRAIN TRAINING CENTER

TRAIN TRAINING EDUCATION ,

TEACHER SKILL DEVELOPMENT ,
POLICE MEETING SKILL DEVELOPMENT DAILY

1. Executive Summary: foundation teacher caree

- OUTCOM EXPLANATOR ORGINATOR
- EXPLANATORY REQUIREMENT OPERATIONEL ,PHASE :
COMPLETED SHEET EVALUATION

1. INTRODUCTION : development :
 2. 1. CAREER AND PSYCHOLOGICAL SUPPORT SERVICE TERAPEUTIC.
LEARN
 3. 1.1 TOPIC ACTIVITY. PSYCHO - -EDUCATION
 4. 1.2 PSYCHOTECHNICAL
 5. 1.3 PSYCHO- PEDAGOGICAL FOUNDATION
-

6. 1.4 TEACHER
 7. 1.5 DIDACTIQUE EVALUATION QUALIFICATION
 8. 1.6 WRITE ORAL LANGUAGE
 9. 1.7 METHODOLOGICAL AGREEMENT.
 10. BAGROUND TO STUDY RESEARCH AIMS :
 11. 1 CAREER RELATED SERVICE
 12. 1CAREER GUIDENCE AND COUNSELLING
 13. 3. PSYCHOMETRIC ASSESSEMENT FOR SUBJECT CHOICE STUDY AND CAREER DECISION LEARNER AND YOUTH SUPPORT CAREER RELATED MATTER. EXPLAIN MATTER GIVED EVIDENCE
 14. 3.1 FRACTION BRIEF :
 15. 3.2 PSYCHOLOGICAL SUPPORT SERVICE :
 16. PSYCHO - EDUCATION AND PSYCHO -EMOTIONAL ASSESSEMENT NOMINAL , PARENTAL AND TEACH SUPPORT
 17. 3.2 SOUTH SCIENCE CAREER EDUCATION INFO ADVISORY PROGRAMME OF SCIENCE WORKSHOP SPECIAL EVENT ADVISORY LEGAL.
 18. 4 SCIENCE CAREER EDUCATION PRESENTATION SERIES : GRADE SPECIFIC SCIENCE CAREER EDUCATION CV ALIGNNED TOPIC FOR SUBJECT AND CAREER CHOICE FOR POST SCHOOL WORK AND STUDY APPORTUNITIE , THESE PRESENTATION COVER A RANGE OF TOPIC AND EQUAL.
 19. 3. [Chapter 1: The School System](#)
 - 20.
 21. PARTICIPATATION COVERS A RAGE OF TOPIC AND EQUAL.
 22. 5. PARTICIPATION WITH IMPORTANT STUDY AND JOB APPLICATION SKILLS OPTION
2. FACULTIE : are housed bhp Billiton , career center is full service career guidance centre providing career counseling workshop and psychometric , assessment for school , learned and of work youth , labor offering , accredited pc training to teacher learners and unemployed 23 4. [Chapter 2: The framework for evaluation and assessment](#)

TIME TABLE JULY ID NUMBER , ,, ID DR CONGO 520 /01. ID PERMIT ATTESTATION, FRQUENTATION COURSE SUBJECT,,,,, RSA SUBJECT APPRIL COURSE LOCK DOWN,..

You sent

4 days ago

WIRING TRAINING TRADING MEETING INPP REQUIREMENT PROFESSIONEL ATTESTATION SERVICE,

You sent

4 days ago

MEMORENDUM , QUESTION PAPPERS,

Yesterday at 5:59 PM

Wed 5:59 PM

You sent

21 hours ago

QUESTION TO QUESTION , ASK TO ASK ,, EXAMNIANTION TO EXAMINATION ,, GIVE SOLUTION TO SOLUTION, TRAIN TRAINING ELECTRICAL WARING QUALIFIE ,, IP TRAINING , MODERATOR ASSESSOR ASSIGNMENT ELECTRICAL WARING EVALUATION, TRAIN TRAINING OFFICER MANAGEMENT , TRAIN TRAINING POLICMENT BRIGADE AREA

ACADEMIC, TEACHER , QAFRICAT INSTITUTION TRAIN TRAINING
CORRECTION PAPPERS , CORRECTION ASSESSEMENT LECTURE TRAINING
NEW LECTURE

[ST.Peace college](#)

sent

21 hours ago

Thanks for messaging us. We try to be as responsive as possible. We'll get back to you soon.

You sent

21 hours ago

NEW LECTURE TRAIN TRAINING FEEDBACK MANAGEMENT ELECTRICAL
WIRING INSTRUCTION EXPLANATORY WIRING CABLING SHEET PAPER,
INSTALLING RULES SABS ,

You sent

21 hours ago

TRAIN TRAINING MRS KEKELETSO LEARNING ELECTRICAL TIME TABLE
TEACHER EVALUATION HANDLING WIRING TARGET,,, PERFORMANCE
ACTIVITY PORTFOLIO TRAINING EDUCATOR,,,,,INTRODUCTION
LECTURE WEEK, TRAIN TRAINING SAFETY LECTURE LEARNERS KEKE ,

You sent

21 hours ago

WATH CREE TECHNOLOGY WATH TRAFFIC TEACHER WAY ,,,
WIRING ,,DISCOVERY COMPONENT DESCRIB COMPONENT WATH
INSTRUCTION GIVEN BRIKLINE ,,,

You sent

21 hours ago

TRAIN TRAINING CAREER INSTRUCTION SUPERVISOR MANAGEMENT
POLICY DAILY RE MARK EXAMINATOR CHIEF MARKER,

You sent

21 hours ago

WATH QUESTION PAPPERS WATH ANSWERING WATH FAULT INVESTIGATE
WATH CORRECTION GIVEN LINE WATH CONFLICT SOLVING DEVELOPMENT
TUTUKANHE CAMBRIDGE, BRIKLINE ,WATH TRANSPORT,ETC

81. 11 Challenge 3: Selecting the right technology, technical support

81. 17. Educational technology manufacture science , isat dissertation

New technology view , review actuality, police institution assessor

82. 13.2 section introduction

83. 2. practical purpose and value of the isa to the workplace test application
competency relevant

84. 2.1 scope of the isat , and policy

85. 2.1 topic 1 mark off basic engineering shapes

86. 2.2 topic 2 ,operate and monitoring drilling to produce simple

87. 2. 3 topic operate and monitoring a milling,

88. 2.4 topic 5 operate and monitoring a surface

89. 3. isat overview / correspondence time table self guidance award .

Sub -task	Activity	Time frame time Allocation	Mark allocation	Discovery Recovery Remark allocation
1	Manufacture two: off Weigh size	2h	30 mark each = 60	
2	Manufacture two found	4h	30mark each 60	
3	Manufacture found	2	35	
	Power Phase		155	
	Total power manufacture	10h		

	System ., process, Fabric ,	2		
	Empower Refund size iso,is sabs	2		

90. 13. 3 Research requirement size number ø, 1 steel

Assessment: the student are allocate: phase obtain assesement mark, final is mode task is complete, the lecture tutorial must ensure that allocate time for the sub task are strict a,

The following assessment tools, are provided for the full conduct of the assessment of the isat, institute police, credit sasseta, seta skill

91. 5.1.1 sub- task 1: checklist, policy list recovery, defensive listed,

92. 5.1.2 sub- task task 2: checklist

93. 5.13 sub-task 3 checklists:

Police affidavit investigation, health proof, compliance, correction police court process, patrol visibility, detective attend

94. 13.4 section task describing instruction section 2 instruction to lectures

>

Access the sequence of achievement , of activity to complete the task time access carefully ,all arrange , ordering of consumable ,prepare work on simulate ,

Section 3 assessment tools,

Checklist Item					
Activity	Size	Mark	Mark foundation Power	Remark Coverly team time, Error Estimal	Discovery team time
1					
2					
3					
4					
3					
13	Total				

95. 13.5 section record of performance integrated summative

Assessment task, found power ed tech

College		Discovery	
Campus			
Student surname and			
Student id number			
Lecture surname and initial			
Date of conclusion of assess			

Assessment grid

Task	Mark allocation	Studied	Discovery Rearward bonus Leave Appeal

				remanufacture Refund time
Sub-task 1	60			60+ day 7 , day
Manufacture found power off	60			
Sub task	35			
Manufacture certified	155			
	%			

96. 13.6 Competence level indicator

5- point achievement rating scale							
5	4	3	2	1	-1	-2	-3
(80-100%)	(70-79%)	60-60%	40-40%	0-39%			

Competence level indicator

Rating code	Rating	Mark%	
5	Rating	80-100%	
4	Outstanding	70-100%	
3	Highly competent	50-69%	
2	Competent	40-49	
1	Not yet competent	0-39	
	Not achieve		

Student competence level student signature. Lecture date

Sponsor by south 32

- 97. 13.7 **EXPLANATORY REQUIREMENT OPERATIONEL ,PHASE : COMPLETED SHEET EVALUATION**

1. Dissertation
2. 97. 12. Technology: Open Source Teaching Platforms

Subject	Research Purpose scope	Project specifically		
Topic1				
Thesis				
Antithesis				
synthesis				

Experimental graduation degradation ,level ,line point show discovery , science time frame work scale, guidance react level ,speed 360 ,pas , state solid liquid

- Prospective short phase point point control how determined calculated measure from supplier circuit earth leakage circuit breaker manufacture rated ,
- Section description of manufacture cover
- 100. 13.10 number of manufacture code installation circuit point discovery ,cover by report , schedule occurred, record,

- Circuit Phase foundation Power	- Exiting Installati on Main distributing	- Su b distributio n	- New Altered Temporary /installation	-	-
-	-	-	-	-	-

-	-	-	-	-	-
-	-	-	-	-	-
- Overhead	-	-	-	-	-
- Section inspection and test new and existing installation	-	-	-	-	-
- Access content correct	-	-	-	-	-
- Protective ,position	-	-	-	-	-
- Respective ,occurred	-	-	-	-	-
- Test	- Unit Intrude	-	- Reading result	-	-
- Conductivity	-	-	- Correct	-	-
- Reactive	-	-	- Correct	-	-
- Continuity react	-	-	-	-	-
- Construct rest	-	-	-	-	-
- Insulation operator	-	-	-	-	-

- Prospective short phase point point control how determined calculated measure from supplier circuit earth leakage circuit bred manufacture rated ,
- Section description of manufacture cover by
- 100. 13.10 number of manufacture code installation circuit point discovery ,cover by
-
-
-
-
- report , schedule occurred, record,

- Circuit Phase foundation Power	- Exiting Installati on Main distributing	- b distributio n	- New Altered Temporary /installation	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
- Overhead	-	-	-	-	-
- Section inspection and test new and existing installation	-	-	-	-	-
- Access content correct	-	-	-	-	-
- Protective ,posit ion	-	-	-	-	-
- Respective ,occ urred	-	-	-	-	-
- Test	- Unit Intrude	-	- Reading result	-	-
- Conductivity	-	-	- Correct	-	-
- Reactive	-	-	- Correct	-	-
-	-	-	-	-	-

Continuity react					
- Construct rest					
- Insulation operator					
-	-	-	-	-	-

- **EXPLANATORY REQUIREMENT OPERATIONEL ,PHASE :**
- **COMPLETED SHEET EVALUATION**
- **Submission statement answering affidavit, claim, time table allocation module**
-
- **100. 13. Technology: Traditional ,and education technology**
-

Section responsibility for existing altered design, responsible, for the design accordance revelation

100. 5.2 material, specification procurement, certify best liability

Name (in block letter) (material didactic lab - library frame .

102. 5.3 construction manufacture best behalf , inspection and test in accordance resultant give manufacture , course subject frame correct , type of a credible , master installation ,

- Module code object frame objective criterion use measure forming cutting tolerance correct manufacture checking install safety aspect adhere , test circuit manufacture diagrammed schedule , 25 question min test 80 % pas explanation of manufacture technical to be 100 % functionally correct interpretation , engineering for an acceptable code of practice ,material conductivity copper , aluminum ,correct, code ,manufacture prepare welding :
-

5.4 inspection , bare , breakdown counter measure , safety improvement,equipement ,light file , maintenance , inspection file , monthly inspection , result unfinished active bark down analyze of maintenance resulted and data for active , terminal monitor equipment , special ,lest maintenance ,historical, non periodic, maintenance equipment chart ,maintenance , inspection file report mid , terminal ,schedule monthly list a,b chart schedule ordering proceeding maintenance execution ,check maintenance resultant maintenance report ,

Factor	Phenomenon	Description	Basic Condition	Relevant Of equipment	Recovery
Defense				Omitting	Discover Low
Offense				Assembly Contact	
Dry Battery Process	Batteries Failing On raving	Loss of balance shift of conch	1. Condition creation 2. Friction 3. Condition 4. Condition 5. Shaking faction 6. Intern contact	Of equipment Omitting Assembly Contact	

Management industries flow chart manufacture policy adviser to read insurance policies plan issue

Institute or making sure people obey the law , in order event public ,legal complain police deep , daily client affidavit certificate copy case lost , patrol visibility correction court give evidence process machine daily patrol recovery , private policy security safety warning caution cleaning maintenance , station cover fire , fire script traffic facility mediation relation labor break education break arbitral, review court labor career development ,break police ,procedure conductor hr occur ,career,

Conduct training to improve operation and maintenance skill TIME TABLE SHEET ST PEACE COLLEGE TIME TABLE REPORT ERGONOMETRI, TIME ALLOCATION

Plan	Policy Meeting	Maintenance manager	Maintenance executive	Recovery policy
Plan	Company Policy..	Annual goals Maintenance schedule	Investigation Pepper	Discovery Operation Records evaluation Improvement And education Manufacture
Do		Education and assistance Period -preventer repaired inspection patrol	Check maintained Result	
Check		Maintenance, statistic report report evaluation	Maintenon record	
action		Maintenance Prevention Design And data -prevent recur		

Plan	Engineering	Maintenance	Production	Maintenance
Plan	Annual equipment Inspector			Control flowed char advance
Do	Month 25 Weekly	Maintenance schedule		
Check	Daily	Maintaining meeting Daily		
Take action	Week holiday maintenance record confirmation of resultant			

Training operator advance management supervisor , basic testing experience work learning applier teaching mastering skill top - and middle worked ,learners skill , learning basic low mark ,learning basic equipment same









Require Adie	Subject	Element
3day		Basic
		Advanced
		Filling

103.

System development .file registers SUBMISSION TIME TABLE completed table outcom.

Found, process, fabric manufactures engineering seta.merseta. TIME TABLE LEARNING

Project planning documentation :										Page																																
System y system modification Where house																																										
System---scheduled activity Completed activity			Analyst ,subm ission reason petition			Signature																																				
Activity Log activity review			Individual assigned			Week																																				
						<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									1	2	3	4	5	6	7	8	9	10	11	12	13	14														
1	2	3	4	5	6	7	8	9	10	11	12	13	14																													
R1-requirement definition File petition Submission. Fee cost industrial Plaiting Record			Vp,cecil,be			<div></div>																																				
R2. Form project team Record transcription digital a Project						<div></div>																																				
R2. Define object and constrain						<div></div>																																				
R.3 interview court house staff																																										
For requirement Retrieved Requested.																																										
R.4 organize requirement \\ Bargaining council at						<div></div> <div></div>																																				
R.5 vp review																																										
d-design						<div></div>																																				
D1 revise program space																																										
D.2.1 specify screen																																										
d.2.2 specific report record transcription																																										

<u>D.3 Specific doc. Change</u>		
<u>D.4 management review</u> <u>Retrieved resource humain review recognize.</u>		
<u>I .1, implementation</u>		
<u>i.2 code program change</u>		
<u>I.2.1 build tats file form</u>		
<u>I.2.2.Build production file</u> <u>Security safety police outcome report. cat register</u>		 
<u>I.2.3Revise production</u>		
<u>I test production file</u> <u>Vie meter data base employe, labor</u>		
<u>i.5 management review</u>	<u>team</u>	
<u>Install court house where house company</u>		
<u>Train new procedure</u>		
<u>Install</u>		
<u>Management review</u>	<u>team</u>	
<u>Weekly team review</u> <u>s shows here ,report for warehouse 2 trough</u>		
<u>Is</u> <u>Organization incorporate is 9000</u> <u>quality management gnat show progress</u> <u>system activity appropriate cells.</u> <u>lower case tools, package advantage,</u>		

Question answering affidavit , response self, _____

St Peace College:

Author submission tshingombe tshitadi :student

Learner teacher and educatory activity: keke, conie

TOPIC: ORAL PRESENTATION. _____ Assessment test

INTRODUCTION: LEARNING ENGINEERING ELECTRICAL THING ABOUT

Professional and council engineering ruling and council education trading and training school
high grade qualification trading and training school , high grade qualification saqa degree ,
plume between countries developing and agreeing buy consentient association and
commissioner international.

-typical , unesco unique, un ,fmi , eic , cebec , sabs , saqa , epsp , esu , organisation rational, interne country and international , country committed congration sadc, country agree ,, and according a framework , and support, communality for , transcript and translate , letter exchange subject , for academique and school , training equivalent , founding a protocol legal phase service council cooperation international and inter regional to work and studied visa in phase country sadc including rsa parternaria t and studied visa in those country sad including rsa partenariat and studied visa rsa drc , embassy , to make verification documentation educational rsa , drc portofolio and planing educational in english africanse and french dr congo diplomatie,

-following in the time and actualie learning mr tshingombe tshitadi , interview and phase , high school school my research an saqa framework and time table , allocation involve electrical engineering follfollowing education technical , enginerring time table , support framework compliance and condition ,

-study subject assesement saq award degre diploma , that is not meet framework saqa for , criteron test saqa supplementairy

- course teacher give to student engineering practice over time table over subject no including documentation language in rsa system , educational councilat ,

- my integration in college education high graduation diploma engineering to achieve mark , score record , transcrip and certify copyrith reward , award , statement compelling are true and achieve the verification agree saqa and council the time table presented , in the high grade degree diploma record sale and pricing award , reward extra subject criterion outcome , exhibited screed , saqa development college vocational , technical learning distance career professional , policy saqa term award for, 1th and continuing college 2th phase over 3 month no examination and certificate department .

Topic, business.	Mark	Remark
Oral presentation		
Confidence	5 mark	-5mark
Eye contract	5 mark	
movements	5mark	
Topic	5 mark	
Grammar punctual	5 mark	
Functioned pronoun		
Total mark	25 mark	

TOPIC 2. LEARNING ENGINEERING TIME TABLE ASSESSEMENT

DESIGN TABLE ALLOCATION MARK: mark saqa module award degree diploma engineering electrical time

- Abstral :Development project curriculum vitae presentations project art work , superior quality polytechnic professional service education award degree council creating value for monetary file pocket document wallet
- -read :book engineering electrical trade textbook rearward homework class work , framework student and daily learning , superior quality
- Prepare and oral : resume and practice assessment give oral award degree diplomat meet requesting saqa coition engineering module completed discovering language extra subject in rsa . allocation math , science engineering , industrial electronic, trade theory electrical, , engineering electrical outcome ,criterion exhibit module semester learning reward workbook, presented saqa.
- Enforcement: low experience engineering command , saps saqa policing requesting low educational council saqa
- Exam : find experience engineering course by topic course number , accreditation award minimum criterion

- 2 collection :audio video lecture , on line textbook , news course not visited course , supplement air resource , cross disciplinary
- Topic list energy , entry engineering learning electrical outcome award

-translated course education award degree diplomat certificate test evaluation dr Congo examination high grade institution pedagogy technical examine and test attestation preparatory high grade diploma subject science technical pedagogy , math chemistry physic technology mechanical electrical design technical drawing electrical , examination evaluation unkin, training formative subject module initiation informatique mathematique laboratory , module traetement text and table , access data base ms dos ms windows ,ms world ,ms excell, certificate regognise resulte reusite university of kinshasa faculty science department math info outcom criterion sawa award degre diploma un training unresponsive meet requirement undergraduate training information pc math , inpp formative training rdc jury oral practice training test testament attest service motoring training preparatory pre - course subject motoring petrol initiation service level or a1,a2,a3, training unresponsive saqa , reason basic advanced filing tvet level professional or distance learning level certificate career council professional functioning role outcome labor work public training ccma labour out educational system , reasoning does meet requirement enprentiship tvet practical council engineering electrical or social council at , education council professional close corporation to labour institutional examination no to educational department accreditation seta merseta trading council in education technology . phase foundation teaching,engineering level.intermediare. inpp close minister work social and education dr congo institutionel multi vocational multi discipline.

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- Our supporters other ways to contribute, other ways contribute scie bono center librarie, public free air time .resaerch assesement mentor counseling center.

-modeling and assement for engineering electrical time : table allocation project , engineering foundation system award degre diploma saqa screedn control submission and st peace control task assement ,

Modeling and assement for policy , course home syllabus calendrar , reading ,lecture note , assignment , projet ,

-the term project student saqa use scientific research model to address policy issue (im) instructor , instructor proof , military course number , level

Level: graduate course description other version related saqa course system education rsa

-course features: lecture note project and examples assignment saqa translate and transcription language control education meeting requesting subject by close cooperation and international sad need to verified the same allocation and topic again fault ,prospectus to be review or overview.

- course description : modeling and assessment for policy explainers how scientific saqa and dr congo research center education informer review policy decission making or inspecting , students will develop an understanding of quantitative modeling , technical to learning and equivalente award in good reason monetary budget compensation u.if labour reason case ,trading and interactive , activities the course adresses issues such - as analysis of scientific assesement process, use of integrated assesement model , public perception of quantitative information methodic for dealing with uncetainties , and design choices in building policy , relevant model, examples use in this class focus on model , and information use in earth systeme,

- feature , course work , police news fieds tip video , police body armor , duty gear , fire arms , police software , police uniforms , saqa or st peace college rating topic no granted ,

-police vehicle product duty geor at cops rsa or intelligence service police scientific trt or training police for assesement policy,inschool learning student award diplomat price to ertify or evaluation over stay of 3 month examination academic transcript saqa , reason labour court or examiner educational high degre disclaim reason no fundamental time or credit saqa non attendance examination qualification high eduction

- popular topic investigation k-12 Or k9 , grade phadse officer safety officer shooting patrol issue heroes , saps all policy saqa close cooperation topics ,

- resource new letters , police directory grant job training , police policie , saqa community training assesement community integrating task assesement or time table allocation,

- in our nextwork , our police one parteners ,saps corrections news , fire video local gove ,police booking or meet requirement reasoning saqa fails to agreeing our translate or to be granted certificate 3 month later .

-museum of science making models, exhibit for thisa problem sets your will need to visite the saqa ,

- model exhibit graduation saqa statement located or criterion after going through . the exhibit.
Respond to the following , question verification saqa, transcrib dr congo or unesco task allocation.

1. critif you were designing a similar exhibit about understanding models the goal of the exhibit saqa 1tsh does not also submensioning or exhibiting , wath does exhibiting if anything , why or why , to teacher visitor saqa, choose simillar object he exhibit if anything , why or why not what's missing would , choose one particular component , engineering electrical

-describe the comonent , wath does it commodels , unicate to visitors about is the comonent effect ,

-agree outcom form perspective open course limitatator , timetable

Topic and activity	material	Daily
Probleme set visited saqa	Translate copy and equivalente certificate	
Making model exhibit		
Problem set 2, misk assesement models		
-problem set 3: applying framework to case studies		
- Problem set 4 mains - Modeling of country positions		
- Lrtap simulation exercise instruction		

Report attandace registrar ,

Time table student

Engineering electrical time table,

Lecture activity

Practical and theoretical n1,n2,n3,

Name	Surname	Cell phone number	Signature	Time in and out	Occurrence time Table Search Research book Time table
Tshingombe	Tshitadi	0	n	08 / 14h	Research time table Trade theory electrical, engineering science , engineering drwawing , industriel electronic Mathematics Skill

					development engineering

schedule work record sheet 3 month attendance , 9 month 17 month record

Clearance student subject allocation no reportable , unopposite , not challenger, record transcript process
time table, filing submission, time table , completed

**TRIMESTER ASSIGNMENT SCHEDULE FOR STUDENTS NATIONAL CERTIFICATE
ENGINEERING STUDIES: INDUSTRIAL ENGINEERING, N1, 2, 3,4,5,6**

SEMESTER MODULE, 1,2, DEGRE DIPLOMAT CONTINUING

SUBJECT	ASSESSMENT TASK	MARK ALLOCATION	CONTENT AVERAGE	STUDENT PROGRAMME	YES	NO
1 Electrical Trade Theory N1 1 Electrical Trade Theory N1	Assignment 1 Assignment 1, 2, 3	310 302 100	Modules 1 to 5 Safety precautions Electrical circuits Resistivity Magnetism Batteries & direct currents Modules 1 to 5 Safety precautions Electrical circuits Resistivity Magnetism	Week 1: Study module 1 & 2 Week 2: Study module 3 Week 3: Study module 4 Week 4: Study module 5 Week 5: Complete & submit assignment 1		

			<p>Batteries & direct currents</p> <p>Modules 6 to 8 Alternating currents</p> <p>Measuring instruments</p> <p>Conductors & insulat Modules 6 to 8 Alternating currents Measuring instruments</p> <p>Conductors & insulat</p>		
			<p>Modules 9 to 11 Wiring of premises Testing Electronics Revision</p>	<p>Week 6: Study module 6 & 7 Week 7: Study module 8 Week 8: Complete & submit assignment</p> <p>Week 9: Study module 9 Week 10: Study module 9 Week 11: Study module 10 & 11 Week 12: Complete & submit assignment 3*</p>	
Assessment Tool: Marking Memorandum	<p>ASSESSMENT CRITERIA</p> <p>OUTCOMES</p> <p>ASSESSMENT MNT SAQA,</p>				
<p>AWARD DEGREE DIPLOMAT CERTIFICATE</p> <p>1TH, 2TH, 3TH, 4TH.</p>	<p>SAQA CRITERION</p> <p>OUTCOMES ORIGINAL,</p>			<p>SUBMITTED SUPPLEMENTAIRE ,</p> <p>CONTINUING PROFESSIONEL , BASICAL ELECTRICAL, TRADE</p> <p>ELECTROSTATIQUE</p> <p>ELECTRODYNAMIQUE, ELECTROKINETIQUE , FUNCTION , EQUATION</p> <p>ELECTROMAGNETISM,</p> <p>SCREEN,.</p> <p>SUPPLEMENTAIRE</p> <p>- COURSE</p> <p>SUBMISSION MARK SUPPLEMENTAIRE TRANSCRIPTION ACADEMIQUE,</p>	

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SUBJECT	ASSESMEN T TASK	MARK ALLOCAT ION	CONTENT COVERAGE	PROGRAME		
2 Industrial ElectronicsN1 2 Industrial ElectronicsN1	Assignment 1, 2, 3	310 302 100	Modules 1 to 3IntroductionAtomi c Theory Cells & battery Module 4 to Capacitance Magnetism AC current theory Inductors and transformer Multimeter semiconductor diodes Transistors Module 1to 11Revision	<div> Week 13: Study module 1 & 2Week 14: Study module 3 Week 15: Complete & submit assignment 1* </div> Week 16: Study module 4 Week 17: Study module 5 Week 18: Study module 6 & 7Week 19: Study module 8 Week 20: Study module 9 Week 21: Study module 10 Week 22: Study module 11 Week 23: Complete & submit assignment 2*		
*Assessment Tool: Marking Memorandum						
AWARD DEGRE DIPLOMAT CERTIFICATE 1TH,2TH,3TH, 4TH.	SAQA CRITERION OUTCOM ORIGINATO R,			SUBMITTED SUPLEMENTAIRE , CONTINUING PROFESSIONEL ,BASI CAL ,FIRE FITTING SAFETY ELECTRONIC ,FIRE ARM ELECTRONIC DIGITAL, ELECTRICAL, TRADE ELECTROSTATIQUE ELECTRONIC CTV , RADIO ,ALARM RELAY SAFETY SECURITY ELECTRONIC POLICY -ELECTROLYSE CELL,		

SUBJECT	ASSESSMENT TASK	MARK ALLOCATION	CONTENT COVERAGE	PROGRAMME		
Engineering Science N1	Assignment 108 118 120		Modules 1 to 6 Dynamics Statics Energy Heat Particle structure of matter Electricity	Week 25: Study module 1 Week 26: Study module 2 Week 27: Study module 2 Week 28: Study module 3 Week 29: Study module 4 Week 30: Study module 4 Week 31: Study module 5 Week 32: Study module 6 Week 33: Study module 6 Week 34: Complete & submit assignment 1* Week 35: Complete & submit assignment 2* Week 36: Complete & submit assignment		
AWARD DEGREE DIPLOMAT CERTIFICATE 1TH, 2TH, 3TH, 4TH.	SAQA CRITERION OUTCOMES, ORIGINATOR,			SUBMITTED SUPPLEMENTAIRE , CONTINUING PROFESSIONEL ,BASIC ELECTRICAL, TRADE ELECTROSTATIQUE SUBMITTED SUPPLEMENTAIRE , CONTINUING PROFESSIONEL ,BASIC ELECTRICAL, TRADE ELECTROSTATIQUE, CONTINUING PROFESSIONNEL , STATIC ,KINEMATIC, ,DYNAMIC,EQUATION,FUNCTION, THERMODYNAMIQUE HEATER, HYDRAULIQUE, PHYSICAL ENGINEERING, CHEMISTRY,METALLURGY, MOTORING,		

4 Mathematics N	Assignment 1, 2, 3	115 115 125	Modules 1 to 5 Orientation Exponents & logarithms Algebraic operations Factorization Equations - Modules 6 to 9 Algebraic graphs Triangles Trigonometry Mensuration & percentages Modules 1 to 9 Revision	Modules 1 to 9 Revision		
AWARD DEGRE DIPLOMAT CERTIFICATE 1TH,2TH,3TH, 4TH.						

SUBJECT	ASSESSMENT TASK	MARK ALLOCATION	CONTENT COVERAGE	PROGRAMME		
			2 Engineering Drawings N1 Assignment 1 } 100 Modules 1 to 9 Fundamentals Computer aided draughting Freehand drawing Geometrical construction Reproduction drawing First-angle orthographic projection Axonometrical drawing Geometrical solids Section drawing Week	3: Study module 1 & 2 Week 14: Study module 3 Week 15: Study module 4 Week 16: Study module 5 Week 17: Study module 6 Week 18: Study module 7 Week 19: Study module 7 Week 20: Study module 8 Week 21: Study module 9 Week 22:		

				Complete & submit assignment 1* Week 23: Complete & submit assignment 2* Week 24: Complete & submit assignment 3* Assignment 2\ 200 Assignment 3\ 200 *Assessment Tool: Marking Memorandum		
CONTINUING AWARD DEGRE DIPLOMAT , EXPLANATORY TRANSCRIPTION						
ELECTROTECHNICAL						
ELECTRO TECHNOLOGY						
LOGIC SYSTEM						
INDUSTRIEL ORIENTATION ORGANISATION INDUSTRIEL						
EDUCATION TECHNOLOGY RELATE ENGINEERING FOUNDATION ENGINEERING CONSTRUCTION LEVEL				PHASE FOUNDATION ENGINEERING ELECTRICAL, INTERMEDIATE, SYSTEM, PROCESS, FABRIC MANUFACTURE ,MAINTENANCE,		

CHECKING SUBMISSION ALLOCATION TASK ,YES OR NO, FRAMEWORK.POLICY ASSESSEMENT REPORT DAILY OK, NO , SUPPLY AWARARD MARK, PERCENTAGE DEGREE DIPLOMAT , FRAME PRACTICE

ALLOCATION EXISTING COMPLIANCE OR NOT, TEXTBOOK EXISTING OR NOT , CLOSE AWARD
TENDERED ,BID CERTIFICATE CLOSE TIME TABLE,

WEEK SUBMISSION OR NOT, POSTPONENT. CONDUCT STUDENT 1TH, 2TH, 3TH, 4TH AAWARD DEGRE
DIPLOMAT,

TEXTBOOK AWARD RECORD TRANSCRIPTION COST MARK BOOK LOAD PURCHASING EARNING,
DISCOUNT OR NOT CHECK,

5. Topic assessment report daily

, log activity

Report schedule week,

Instruction book,

Booked, learner lecture, policy

Coaching team meeting event feedback, skill development

Training moderation, assessment tools,

Date time	Time departure.	Instruction , Investigate	Action take , Learner	Nature occurred	Corrective Action
-----------	-----------------	------------------------------	--------------------------	--------------------	----------------------

			And assessment		descript
		Post quiz Self-assessment Assignment	Defense factor,	Compliance Condition	Offense penalty Reward award mark

Time in Series booked Number	Time out Criterion	Instruction booked Remark Search	Action take Research tools	Checking tools , booking Action take	Nature occurred book checker review time line	Corrective Inspection booked ,

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SCREEN: B1 DATABASE.

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-electrical engineering: school qualification entrance st peace.	Engineering award learn
-HIGHR EDUCATION QUALIFICATION : ENGINEERING AWARD LEARN	SUBMITTED CERTIFICATED
-FINAL AWARD DEGREE DIPLOMA CERTIFICATE	SUBMITTED , ok
-TRANSCRIPTS OF ACADEMIC RECORDS REFLECTING EACH OF YEARS STUDY 1 ST PEACE COLLEGE, POST GRADUAT, AWARD DEGREE DIPLOMAT. -ADMNI REQUIRED RECORD PASS , National Certificate N1-N3: Engineering Studies (Electrician)Course Contents N4,5,6, :Mathematics Electrotechnics	1x not submit , no SUBMITTED ,OK

Logic Systems Industrial Electronics,	
-COUNTRY SPECIFIC DRC SCHOOL LEAVING CERTIFICATE -DIPLOME D'ETAT EXAM D'ETAT DR CONGO , BULLETIN : TRANSLATE LETTRE NOTE COURSE RWITTEN MATTRIC GRADE 11,12 MASTER SKILL PEPARATORY . COMMENT. EXPLANATOR LEAVING - Certificate: mathematique informatique unikin, 1 niveaux attestation requisiite 1 niveaux initiation ms dos windows, module 1, traitement text table ,ms word, ms excel. RESITTE - Attestation: frequentation preparatory ispt kin section pedagogies technique electromecanique, electrotechnique, electronique construction subject. - RESSITE - Attestation provisoire: inpp service. MOTORISE MOTEUR ESSENCE, REUSSITE. -	-SUBMITTED CERTIFICATED ,11 . ,12 grade ok, certified not submission ,11 . ,12 grade ok,
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SAQA
<noreply@saqa.co.za>

Fri, Dec 20, 2019, 8:59
AM

to me

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Problem



Suggestion



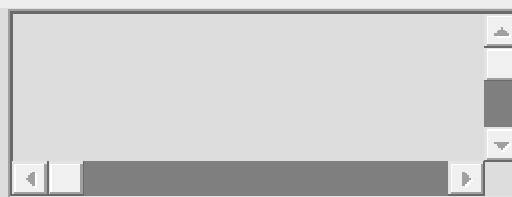
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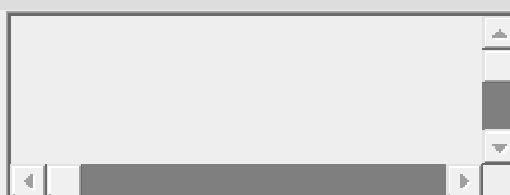
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Diploma



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Tshingombe Tshitadi

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Learn & Get Certificates

Build Your Career 2

Your Earnings 1

1

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Create Your Free Resumé

Workplace Personality Assessment

Preferred by 80% employers, take our Workplace Personality Assessment to discover who you truly are

Start Your Free Assessment

1

Mental Wellbeing Check-Up

Measure your emotional and physical wellbeing by answering a set of questions

YourMonthly Learner Report is in!

Check out your stats for the month, see how you're growing, and aim to achieve even more next month!

Learning Stats in December

December 2023

M

Days you learnt

Best learning day

You learned 0 days this month

0 days less than last month

0 mins

Total Time Learning

1st Dec

|

0 mins

Best Learning Day

Average number of hours you learn on days of the week

MON TUE WED THU FRI SAT SUN 0 0 0 0 0 0 0

tshingombe, you asked us to remind you to learn on Mondays. So, here we are.

Keep up the momentum and continue your learning from where you left off now! After all, taking the time to invest in yourself is a great way to start the week and stay on track with your goals.

You can [update](#) this study reminder at any time.